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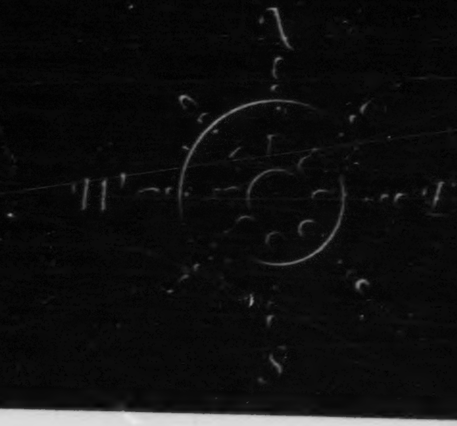
**Department of
Agriculture and Marketing**

Soils of Pictou County, Nova Scotia

Report No. 18

Nova Scotia Soil Survey

1990



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Soils of Pictou County, Nova Scotia

Report No. 18
Nova Scotia Soil Survey

K.T. Webb
Land Resource Research Centre
Truro, Nova Scotia

Land Resource Research Centre
Contribution No. 85-44

(NTS Map sheets 11E/6, 7, 8, 9, 10, 11, 14, and 15)

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*Retired

SUMMARY

Pictou County encompasses about 275 000 ha of land and is located in north-central Nova Scotia between latitutdes 45° 15' and 45° 50' north and longitudes 62° 05' and 63° 10' west.

Pictou County has a cool, humid, temperate climate. Mean annual temperature is 5.6°C; annual precipitation is 1250 mm and snowfall averages 240 cm. Annual total degree days above 5°C average 1700, and the average frost-free period in 100 days.

Forests cover 75% of the area and are composed of 41% softwoods, 33% hardwoods, and 26% mixedwoods.

The coastal plain of the lowlands is undulating to rolling and is covered with acidic, moderately fine to moderately coarse textured, till derived from shale and sandstone. Soils developed on these materials are predominantly Gleyed Podzols and Orthic Gleysols of the Pugwash and Hansford associations, and Gleyed Gray Luvisols and Luvic Gleysols of the Queens Association.

The lowlands rise gradually to the south between the Cobequid Upland and the Pictou Highlands and terminate at the Horton Highlands, forming Pictou Basin.

The Pictou Basin landscape is rolling to hilly and blanketed in acidic, moderately fine to moderately coarse textured tills derived from shale and sandstone. Soils developed on the tills are gravelly, stony, and predominantly Orthic and Gleyed Podzols of the Thom, Millbrook, and Woodbourne associations. Coarse-textured glaciofluvial sediments are common in valley bottoms. Soils developed on these sediments are gravelly Orthic Podzols of the Hebert Association.

The Cobequid Upland and Pictou Highland are steep-sided, plateau-like areas that rise above the lowlands to a fairly uniform elevation of 260 m. Their rolling to hummocky surface is covered with shallow deposits of acidic, moderataely coarse textured, stony, tills derived from igneous, metamorphic, and sedimentary rocks. Soils developed on these tills are stony Orthic and Gleyed Podzols and Orthic Gleysols of the Wyvern, Cobequid, Kirkmount, Thom, and Barney associations.

The Horton Highlands are on an elevated plain that extends along the southern end of Pictou County. The plain's undulating to rolling surface is covered by acidic, moderately fine to moderately coarse textured, tills of variable thickness and stone content. Soils developed on these tills are Othic and Gleyed Podzols and Orthic Gleysols of the Perch Lake, Bryden, Millbrook, and Kirkhill associations. Organic soils of the Castley Association are common in depressions.

The suitability of each map unit is interpreted for agriculture, community development, forestry, and source of material uses.

RÉSUMÉ

Le comté de Pictou s'étend sur environ 275 000 ha dans le centre-nord de la Nouvelle-Écosse entre les latitudes 45° 15' et 45° 50' nord et les longitudes 62° 05' et 63° 10' ouest.

Son climat est tempéré, frais et humide. La moyenne annuelle des températures est de 5,6 °C; celle des précipitations est de 1 250 mm et celle des chutes de neige, de 240 cm. En général, le nombre de degrés-jours supérieurs à 5 °C est de 1 700 par année et la période sans gel, de 100 jours.

Les forêts couvrent 75 % de sa superficie et se composent de 41 % de résineux et de 33 % de feuillus, le reste (26 %) étant des peuplements mixtes.

La plaine côtière des basses terres est onduleuse à accidentée; elle est constituée de till acide, modérément fin à modérément grossier, dérivé du shale et du grès. En ce qui concerne les sols qui se sont formés sur cette assise, il s'agit surtout de podzols gleyifiés et de gleysols orthiques des associations de Pugwash et de Hansford ainsi que de luvisols gris gleyifiés et de gleysols luviques de l'association de Queens.

Les basses terres montent graduellement vers le sud entre l'élévation de Cobequid et les hautes terres de Pictou pour se terminer aux hautes terres d'Highlands, formant ainsi le bassin de Pictou.

Le paysage du bassin de Pictou est accidenté à montagneux; il est constitué de tills acides modérément fins à modérément grossiers dérivés du shale et du grès. Les sols formés sur ces tills sont graveleux, pierreux et dominés par des podzols orthiques et gleyifiés des associations de Thom, Millbrook et Woodbourne. Les sédiments glacio-fluviaux à texture grossière sont communs dans les fonds de vallée. Les sols formés sur ces sédiments sont des podzols orthiques graveleux de l'association de Hebert.

L'élévation de Cobequid et les hautes terres de Pictou sont des genres de plateaux escarpés qui s'élèvent au-dessus des terres basses jusqu'à une hauteur assez uniforme de 260 m. Leur surface accidentée est couverte de dépôts peu profonds constitués de tills acides, moyennement grossiers et rocailleux, issus de roches ignées, métamorphiques et sédimentaires. Les sols qui se sont formés sur ces tills sont des podzols gleyifiés et orthiques rocailleux et des gleysols orthiques des associations de Wyvern, Cobequid, Kirkmount, Thom et Barney.

Les hautes terres de Horton sont une plaine élevée qui s'étend le long de l'extrémité sud du comté de Pictou. La surface onduleuse à accidentée de cette plaine est couverte de tills acides, fins à modérément grossiers, dont l'épaisseur et la pierrosité varient. Les sols qui se sont développés sur ces tills sont des podzols orthiques et gleyifiés et des gleysols orthiques des associations du lac Perch, de Bryden, Millbrook et Kirkhill. Des sols organiques de l'association de Castley sont communs dans les dépressions.

L'utilité de chaque unité cartographique est interprétée en fonction de l'agriculture, du développement des collectivités, de la foresterie et des utilisations des sources de matériel.

GENERAL DESCRIPTION OF THE COUNTY

Location and extent

Pictou County is located in north-central Nova Scotia between latitudes 45° 15′ and 45° 50′ north and longitudes 62° 05′ and 63° 10′ west. It is bounded by Colchester County to the west, Antigonish County to the east, and Guysborough County to the south. The northern boundary of the county is approximately 200 km of coastline on Northumberland Strait (Fig. 1). The county covers 289 100 ha, of which 4.3%, or 12 431 ha are lakes and rivers.

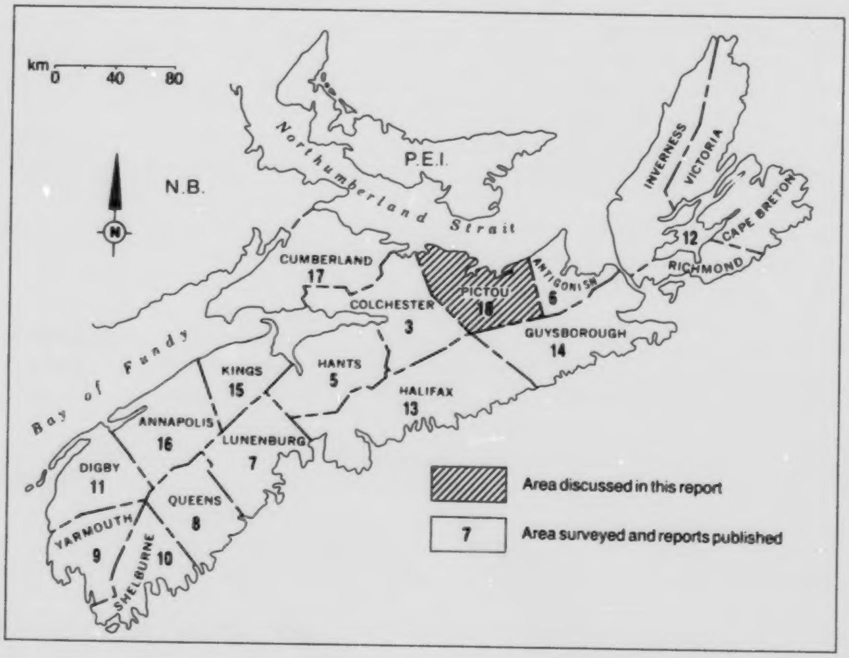

km 0 40 80
N.B.
P.E.I.
Northumberland Strait
Bay of Fundy
INVERNESS
VICTORIA
CAPE BRETON
12
RICHMOND
CUMBERLAND
17
COLCHESTER
3
PICTOU
18
ANTIGONISH
6
GUYSBOROUGH
14
KINGS
15
HANTS
5
HALIFAX
13
ANNAPOLIS
16
LUNENBURG
7
DIGBY
11
QUEENS
8
YARMOUTH
9
SHELBURNE
10
Area discussed in this report
7
Area surveyed and reports published

Fig. 1. Location of Pictou County and counties of Nova Scotia previously surveyed.

History of development

Settlement of Pictou County began in 1767 with the arrival of English immigrants from Maryland and Pennsylvania, USA. The first Scottish immigrants arrived on the Hector in 1773. In 1798 coal was discovered at Albion Mines, later to be called Stellarton. By 1827, all land capable of economic cultivation was taken up by agriculture and the population had grown to 13 949. The year 1827 also marked the beginning of the coal mining era. For the next 125 years coal was the dominant economic factor in the county and this resulted in an influx of mining immigrants from Britain.

In 1839 the construction of a railway to ship coal from Albion Mines to the Abercrombie wharfs was completed. In the mid-1800s the population increased substantially because of the economic prosperity resulting from coal mining. During this period shipbuilding was an important activity in New Glasgow and Pictou. Although industry diversified had expanded during this period, agriculture was still dominant and the largest employer.

In the latter half of the nineteenth century coal mining continued to expand as new mines were opened at Westville and new railway lines were built to Granton and Pictou Landing. At their peak the coalfields employed more than 2000 people and produced 816 000 metric tons of coal a year.

By 1871 the population of the county had reached 32 114. In the 1880s, increased railway construction enabled some of the population to move to better agricultural areas in Canada and the United States and this contributed to a decline in the importance of agriculture in the county. During that same period the foundations were laid for the county's era as leader in heavy industry, an era that lasted until the end of World War I. The steelworks at Trenton was built during this period, and in 1882 the first steel ingots produced in Canada were poured there. By 1912 the steelworks produced 50% of the steel consumed in Canada at that time.

In the 1920s the axis of commerce moved away from Atlantic Canada to Quebec and Ontario, and Pictou County lost its leadership in heavy industry. The heavy industry in Pictou County suffered during the depression of the 1930s but enjoyed a revival during World War II. The post-World War II era brought a downturn in the steel industry, and coal mining in the region was also in a downturn. The last of the large mines to remain in operation, the McBean Mine at Thorburn, was closed in 1972.

Following a period of general recession in the early 1950s there was an economic revival in the county through the 1960s and 1970s (Nova Scotia Department of Development 1982). Once again, Pictou County had become a centre of manufacturing activity. Many of the older industries such as those involved in the production of railway car axles and heavy forging, rolling stock, ships, structural steel, bricks, and tiles, have stabilized and seem to be progressing (Nova Scotia Department of Development 1982).

Population and industry

Between 1827 and 1871 the population of Pictou County more then doubled from 13 949 to 32 114. The population then increased at a slower rate until 1921, when it reached 40 851. Through the 1920s the population decreased to 39 018 in 1931. A resumption in growth continued until the mid-1950s reaching a high in 1956 of 44 566. After a small decline in the late 1950s growth resumed and continued into the 1980s. In 1986, the population of the county was 49 772.

The principal centres are New Glasgow (10 022), Stellarton (5259), Pictou (4413), Westville (4271), and Trenton (3083) (Fig. 2). The total population of these five towns represents the urban population and constitutes 54% of the county total. The rural population of 22 724 comprises the remaining 46% of which 1285, or 2.6%, live on farms.

Manufacturing is an important economic activity in the county. The largest single employer is the tire plant at Granton. The steelworks at Trenton is another major employer; it produces railway cars, rolling stock, and heavy forgings. Because the demand for pulp logs by the pulp mill at Abercrombie Point has stimulated forestry activities, the amount of wood cut for pulp far outweighs the amount cut for lumber. Shipbuilding and repair are important economic activities in the town of Pictou.

Other manufactured items from the New Glasgow - Stellarton area are textiles, lumber and wood products, paper products, fabricated metal products, machinery, transportation equipment, apparel, chemical products, and rubber and plastic products.

The fishing industry does not play a very important part in the county's economy relative to other sectors of the economy, and employs less than 1.5% of the labor force.

Transportation

The county highway network is excellent and has 2174 km of all weather roads, 30% of which are paved.

The Trans Canada Highway runs through the middle of Pictou County connecting New Glasgow, Westville, and Stellarton to Truro, Halifax, and New Brunswick to the west and Cape Breton to the east. A main arterial from the Trans Canada Highway connects to Pictou and Nova Scotia's only ferry terminal to Prince Edward Island at Caribou (see Fig. 2).

The Canadian National Railway (CNR) from Halifax to Sydney via Truro, passes through the county, with daily passenger and freight services to New Glasgow and Stellarton. The CNR also runs a freight line from Stellarton via Westville to Abercrombie Point and a spur line to Granton (see Fig. 2).

A commercial airport is operated by the town of Trenton and is used by air charter services and local planes.

The best harbor is at Pictou where the facilities are suitable for handling large ocean-going vessels. A smaller wharf is located on the East River at New Glasgow. Smaller harbors are located at River John, Caribou, and Merigomish, and numerous inshore fishing wharves are scattered along the coastline.

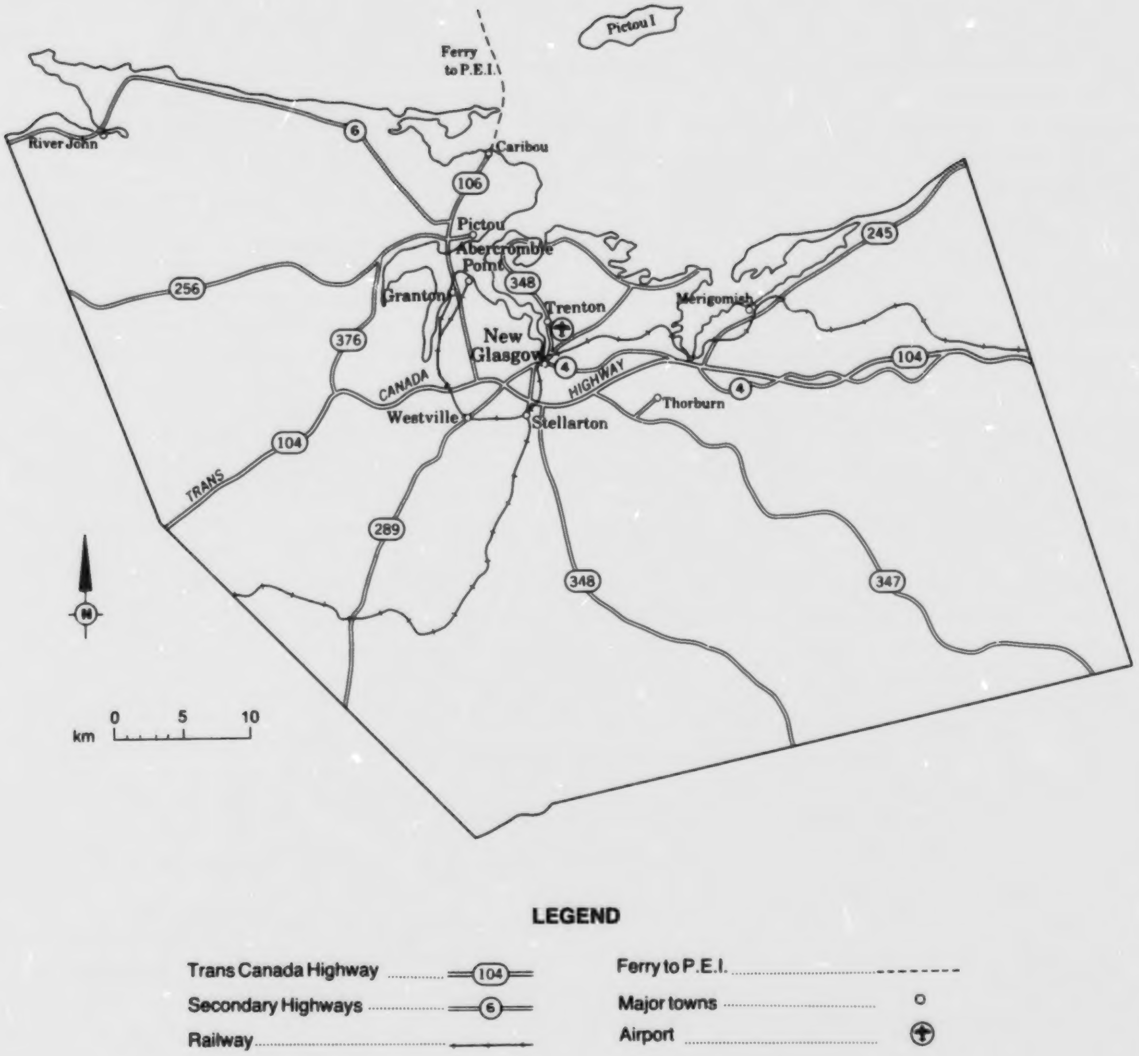

Pictou I
Ferry to P.E.I.
River John
6
Caribou
106
Pictou
Abercrombie Point
256
Granton
348
Trenton
New Glasgow
376
4
245
Merigomish
104
TRANS CANADA HIGHWAY
Westville
Stellarton
Thorburn
4
104
289
348
347
km 0 5 10
LEGEND
Trans Canada Highway 104
Secondary Highways 6
Railway
Ferry to P.E.I.
Major towns
Airport

Fig. 2. Location of towns and transportation routes.

Glaciation

Ice sheets completely covered Nova Scotia during the Wisconsin glaciation, which ended about 12 000 years ago. Local ice caps probably covered the higher areas of Nova Scotia during both the earlier and later stages of glaciation (Prest and Grant 1969). Ice caps would have occurred in the Cobequids, in the higher areas of Pictou and Antigonish counties, and on the plateau of northern Cape Breton.

Glacial action appears to have been light in these areas, perhaps because of thinner ice cover over the high ground or because these areas were protected by early snow cover (Roland 1982). Moving glaciers appear to have transport eroded materials only for a short time as the composition of the glacial debris is similar to that of the underlying bedrock (Cameron 1965).

During recession of the glaciers there was more local ice movement in Nova Scotia, and glacial features indicate changes in ice flow direction in response to topography, climatic change, and sea level rise (Prest and Grant 1969).

In Pictou County the pattern of glacial movement is somewhat irregular because glacial features indicate an easterly movement north of the Cobequid Upland. Rocks from the Cobequids are commonly found to the east near Pictou and on Pictou Island. South of the Cobequids the ice moved in a southeasterly direction, as indicated by the orientation of the drumlin field at the southern limits of the county, near Trafalgar.

As the glaciers melted away to localized ice caps at the higher elevations, large volumes of water streamed down from the receding edges, washing masses of material downslope. This material was deposited on the plains below as the meltwaters slowed.

In Pictou County great quantities of sand and gravel were washed northward by rivers flowing from the Cobequid Upland and Pictou Highlands. Glaciofluvial outwash from these areas can be found in the River John Valley near West Branch, on the French River near Broadway, through the Piedmont Valley, and adjacent to the lower reaches of Barneys River. A section on the Northumberland Lowlands from Lower Barneys River to Knoydart is dominated by outwash material that was washed from the Pictou Highlands to the south.

Physiography and geology

Pictou County can be divided into four physiographic zones (Roland 1982): the Cobequid Upland, the Pictou Highlands, the Northumberland Lowlands including Pictou Basin, and the Horton Highlands (Fig. 3). On the map Physiographic Regions of Canada (Geological Survey of Canada 1970), the Cobequid Upland and Pictou Highlands are part of the Nova Scotia Highlands, the Northumberland Lowlands and Pictou Basin are part of the Maritime Plain, and the Horton Highlands are part of the Atlantic Uplands of Nova Scotia.

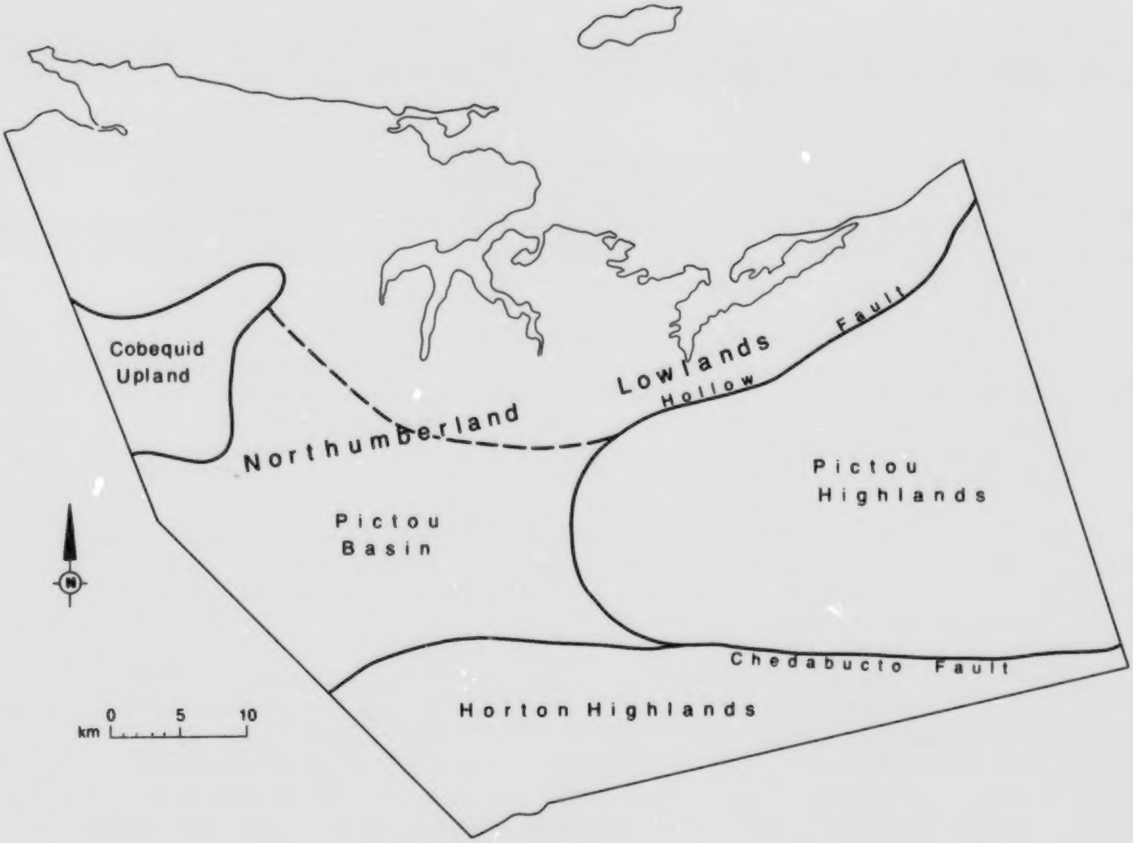

Cobequid Upland
Northumberland Lowlands
Hollow Fault
Pictou Basin
Pictou Highlands
Chedabucto Fault
Horton Highlands
km 0 5 10
N

Fig. 3. Physiographic zones of Pictou County (Roland 1982).

Cobequid Upland

The eastern end of the Cobequid Upland protrudes 15 km into the northwestern portion of the county. This remnant of an ancient Atlantic peneplain forms a narrow plateau with a rolling summit of fairly uniform elevation of about 275 m throughout its length although isolated knolls are somewhat higher. Dalhousie Mountain rises to more than 335 m. The prominence of the Cobequid Upland results from the resistance of its igneous and metamorphic rocks to the erosion that produced the surrounding Northumberland Lowlands (Fig. 4). Cambrian granite is the predominant igneous rock type found in the Cobequid Upland of Pictou County, followed by basalt, rhyolite and felsic tuff of Devonian and Silurian periods.

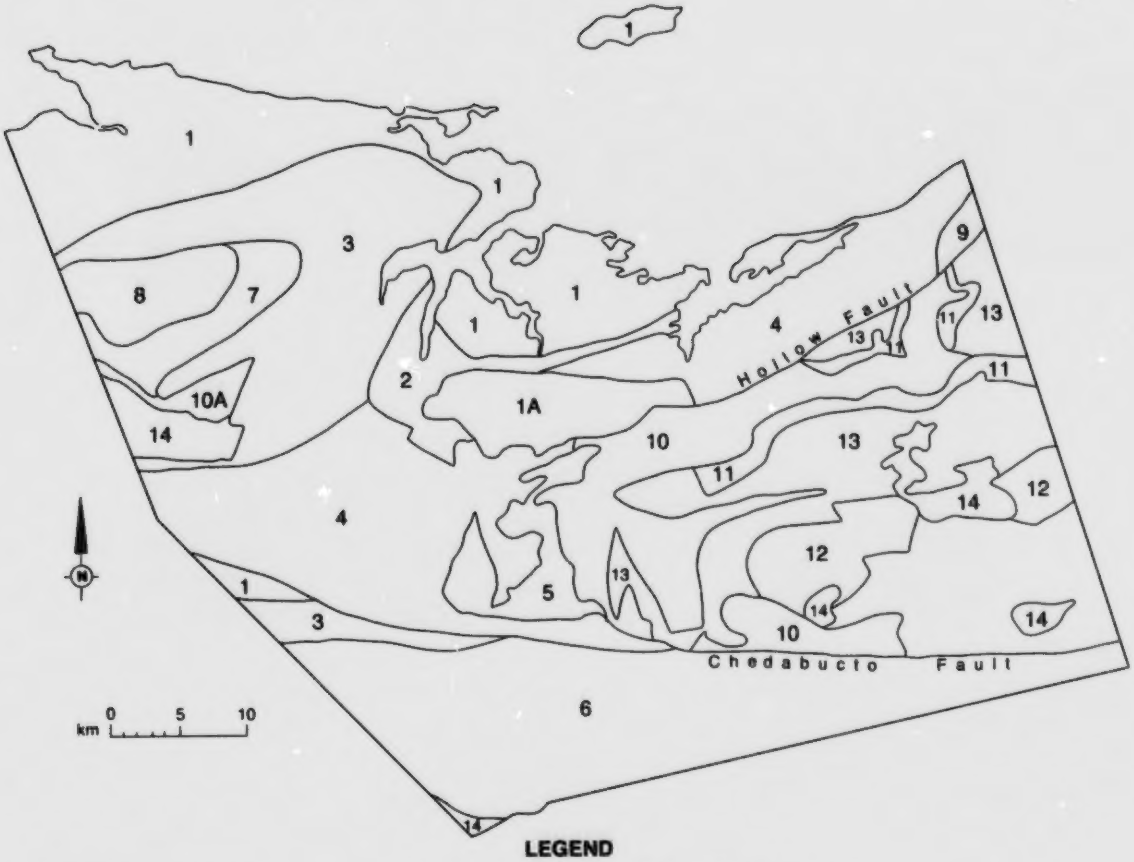
Folded sedimentary rocks of these same periods are present in the Earltown and Falls Formations (Fig. 5). Red Devonian conglomerate from the latter formation forms a broad arc 2-3 km wide from the western county line to Scotsburn. This band of conglomerate has been strongly dissected by tributaries of the River John that flow to the north.

Fig. 4. The Cobequid Upland (in background) form a plateau with a rolling summit, which rises about 100 m above the Northumberland Lowlands (in foreground).

Shallow stony tills predominate in the Cobequid Upland, and rock outcrops are frequent. The till landforms are strongly controlled by bedrock and conform closely to the underlying strata. Slopes are complex but gentle across the top of the Cobequid Upland and moderate to strong in the incised valleys and mountain sides as they grade to the surrounding lowlands. Soils are porous and contain numerous rock fragments from the local bedrock. Glaciofluvial sand and gravel line the bottom of the West Branch River John Valley and where the Six Mile Brook and Fourmile Brook flow down into the surrounding lowlands.

Pictou Highlands

Where the Cobequid Upland terminates, west of Scotsburn, the volcanic rocks disappear beneath a cover of soft Carboniferous rocks that compose the encircling lowlands (Fig. 6). Twenty-five kilometres farther to the east the volcanic rocks reappear, spreading out in an elevated triangle called the Pictou Highlands. The base of the triangle is determined by the Chedabucto Fault in southern Pictou County. On the northwest side of the triangle, the Hollow Fault marks the boundary between the weaker strata along the Northumberland Lowlands and the resistant rocks inland (see Fig. 5). The eastern county boundary demarcates the eastern boundary of the Pictou Highlands. Elevation of the Pictou Highlands range from 210 to 245 m, and when viewed at a distance they have a uniform horizontal skyline.



LEGEND

LATE CARBONIFEROUS

1 Pictou and Stellarton Groups: sandstone, siltstone, shale, conglomerate, coal.

1A Coal Measures.

2 Cumberland Group - New Glasgow Formation: conglomerate, wacke.

3 Riversdale Group: sandstone, siltstone, shale, conglomerate, wacke.

EARLY CARBONIFEROUS

4 Canso Group: wacke, siltstone, conglomerate, shale.

5 Windsor Group: sandstone, shale, mudstone, limestone, gypsum, conglomerate.

6 Horton Group: sandstone, siltstone, arenite, shale, arkose, conglomerate.

LATE DEVONIAN

7 Falls Formation: red conglomerate, wacke, siltstone.

MIDDLE DEVONIAN

8 Diamond Brook Formation: basalt, siltstone, wacke.

EARLY DEVONIAN

9 Knoydart Formaton: siltstone, sandstone, mudstone, wacke, conglomerate.

SILURIAN

10 Arisaig Group: siltstone, shale, limestone, mudstone, conglomerate.

10A Earltown Formation: siltstone, shale, wacke, rhyolite, basalt, felsic tuff.

SILURIAN - ORDOVICIAN

11 Bear Brook Formation: basalt, rhyolite, felsic tuff.

CAMBRIAN

12 Keppock Formation: rhyolite, felsic tuff.

13 Undifferentiated HADRYNIAN - CAMBRIAN: mafic and felsic volcanic rocks, wacke, argillite, siltstone, phyllite, quartzite.

14 Plutonic Rocks of unknown age: granite.

Fig. 5. Generalized geological formations (modified from Keppie 1979).

Fig. 6. The edge of the Cobequid Upland slopes steeply to the surrounding Lowlands.

The strata of the Pictou Highlands are extremely complex and have undergone strong metamorphism, folding, and distortion (Roland 1982). A large part of the highlands is occupied by hardened metamorphics of early Cambrian age. These bedded rocks are closely folded into anticlines and synclines, and the structure is displaced by stocks of granite rock of various sorts and locally of considerable size. In addition to these, the strata are punctured in many places by small intrusions of igneous rock, which are the necks of ancient volcanoes (Goldthwait 1924).

Surrounding the metamorphic and volcanic bedrock core of the Pictou Highlands is a band of Silurian sedimentary rocks of the Arisaig Group. These strata have been compressed and folded and are found primarily on the borders of the highlands and in a wide syncline, called the Kenzieville Trough, south of the Hollow Fault (see Fig. 5).

Shallow stony tills predominate in the central and southeastern sections of the Pictou Highlands where the Cambrian and Precambrian igneous formations are located. The till landforms are controlled by the underlying bedrock. Slopes are complex but gentle, and outcrops are common (Fig. 7). Soils developed on these tills are porous and contain numerous rock fragments of local origin. The tills in the northern and border regions of the Pictou Highlands have been influenced by the Silurian sedimentary strata. These tills are deeper and not as stony or as coarse as the tills derived from the igneous formations.

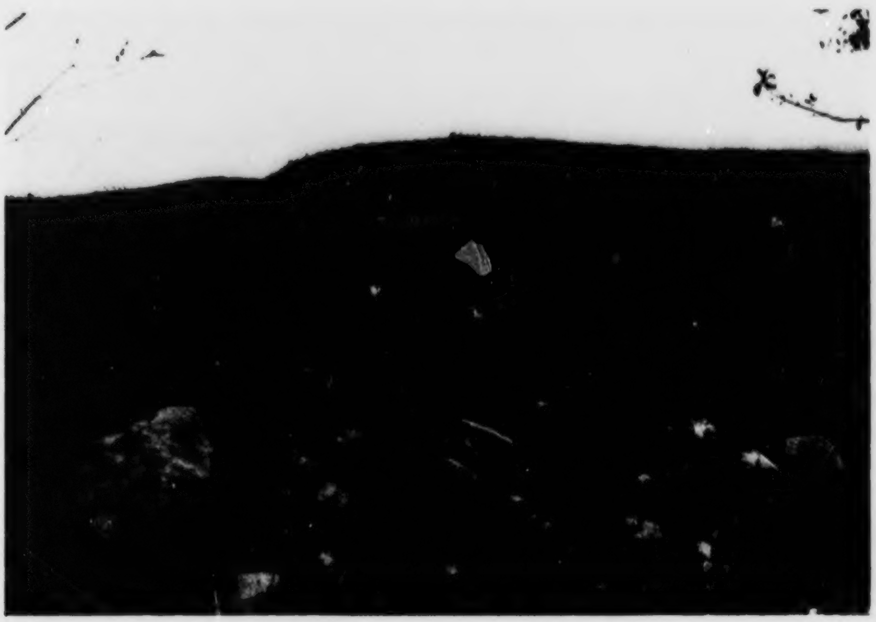


Fig. 7. Bedrock-controlled till landforms of the Pictou Highlands.

Northumberland Lowlands

The Northumberland Lowlands extend from the coast south to Sunnybrae and slightly south of Elgin, Glengarry Station, and Lansdowne Station. The lowlands surround the Cobequid Upland and border the Pictou Highlands on their north and west flanks.

The Northumberland Lowlands are underlain by Carboniferous sedimentary bedrock and slope upwards from sea level to 180 m in the south where they border the Horton Highlands. The coast portion of the lowlands north of the Cobequid Upland and Pictou Highlands and north of Westville is predominantly undulating to rolling till plain (Fig. 8). The till is moderately fine-textured when derived from underlying shale and siltstone but moderately coarse if derived from sandstone and conglomerate.

The northwestern section of the lowlands north of the Cobequid Upland and Pictou Highlands is underlain by Late Carboniferous bedrock and is the most uniform portion of the lowlands. The sedimentary strata contain many minor folds which extend in an east-west direction. The differential erosion of the harder sandstone and softer shale strata tend to create ridges and valleys, which appear in the same direction as the folds. Long smooth ridges trend east and west and swell and sag where the anticlinal axes of the underlying bedrock rise and fall.

These alternating ridges and valleys also determine the outline of the coast along Northumberland Strait. The ridges run out into points at Cape John and Caribou Island. Pictou Island is probably a short remnant of a ridge that once existed in the centre of the strait (Roland 1982).

Fig. 8. Undulating till plain on the Northumberland Lowlands.

The drainage systems are also affected by the pattern in the folding, and run in an east-west direction. Because of its gentle topography and slowly permeable till covering, this portion of the plain has restricted drainage and wetlands, and organic soils are commonly associated with poorly drained depressions and slowly meandering streams.

The east-west ridging in topography becomes more pronounced on the portion of the lowlands between Trenton and Merigomish Harbor. The tills still display a moderately coarse to moderately fine textural range, but contain much more gravel and larger rock fragments than the coastal tills to the west.

The eastern extension of the coastal lowlands displays no adherence to the east-west landform lineations found to the west. The topography of the eastern section of the lowlands is undulating to rolling and is extensively covered in glaciofluvial deposits near the Antigonish border.

At the mouth of the Pictou Basin between Westville and Thorburn lies a series of sedimentary rocks, dominated by soft gray shale, called the Coal Measures (see Fig. 5). This area is gently undulating to moderately rolling and is covered by moderately fine- to fine-textured, impervious, gray till.

South of the Coal Measures between the Cobequid Upland and the Pictou Highlands in the centre of the county is an extension of the Northumberland Lowlands referred to as the Pictou Basin (Roland 1982). The basin bottom is hummocky and hilly and underlain by rocks of the Windsor Group in the east, which are covered by moderately fine-textured tills and sedimentary rocks of the Canso Group to the west, which are covered by a stony, medium- to moderately coarse-textured till. The basin slopes gradually upward in a south and southwesterly direction and borders with the Pictou Highland to the east, the Horton Highlands to the south, the Cobequid Upland to the northwest, and Colchester County to the southwest.

Horton Highlands

The Horton Highlands are located to the south of the Chedabucto Fault (see Fig. 3), which runs next to the resistant rocks of the Pictou Highlands and west into Colchester County. The highlands are underlain by Early Carboniferous sedimentary rocks of the Horton Group and are on an elevated plain, which is tilted slightly to the southeast. Elevations range from 240 m in the northwest to less than 150 m in the south. The rocks of the Horton Group are hard and have generally resisted extensive erosion by the glaciers. This is especially true in areas that are underlain by arenite, which commonly outcrops at the surface. Tills are moderately coarse-textured, shallow, and very stony when underlain by hard sandstone and arenite. The softer siltstone and shale bedrock is overlain by finer, deeper, and less stony tills that occupy drumlinized landscape near the southern tip of the county. Slopes on the Horton Highlands are usually gentle, and wetlands are common on very poorly drained flats and depressions. Significant areas of glaciofluvial sand and gravel are located in the southwest corner of the highlands.

Climate

Pictou County is located within the cool, humid, temperate climatic zone. This zone is influenced strongly by prevailing westerly winds, which cause many of the low-pressure weather systems moving across North America to pass over Atlantic Canada. The frequent passage of bad weather associated with these low pressure systems, and its maritime location, provide Pictou County with ample precipitation.

Pictou County experiences a modified continental climate, which displays great variability in all seasons. This variability is produced by the continual interaction of continental and maritime air masses. The continental influence on the region causes a wide range in annual temperatures. As a result the mean annual temperature range in the county is double that of the Pacific coast.

Continental influence is felt in the warm, high-pressure spell in summer and the cold, clear period in winter. Winters are cold with frequent snowfalls and often kill forage and winter cereal crops. Springs are late, cool, and cloudy; summers are warm and quite humid.

The ocean, by supplying heat when it is cold and cooling when it is warm, moderates the climate, which reduces the temperature range in coastal areas. Most coastal areas of Nova Scotia have milder winters, cooler summers, and longer frost-free periods than interior locations. However the benefit of an extended growing season in these coastal areas is offset by cooler summer temperatures and fewer growing degree days for plant growth (Dzikowski 1983).

The Northumberland shore is an exception, because the waters of Northumberland Strait warm more during summer than deeper, less sheltered coastal waters. Thus the moderating influence in summer is less, which keeps air temperatures warm and enhances the warming influence during the fall. The shore area experiences growing degree days comparable to the Annapolis Valley. In winter the ice-covered strait has little influence in moderating air temperature and also delays spring warming (Dzikowski 1983).

The climatic data for the Stellarton climate station are representative of the Northumberland Lowlands; the Hopewell climate station is typical of the Pictou Basin; and the Trafalgar climate station is representative of the Horton Highlands. Although there are no climatic data available for the Cobequid Upland and Pictou Highlands, one can assume that because of their elevation, the climate would be similar to that of the Horton Highlands.

Total annual precipitation ranges from 1060 mm near the coast at Stellarton to 1443 mm at Trafalgar (Table 1 and Fig. 9a). Average snowfall amounts from 200 cm at Stellarton to 284 cm at Trafalgar. At Stellarton the mean July temperature is 18.9°C and the mean January temperature is -5.8°C. At Trafalgar the mean July temperature is 17.4°C and the mean January temperature is -7.3°C. Extremes of temperature are not excessive; the lowest monthly average of mean daily minimum temperature is -13.9°C at Trafalgar and -11.3°C at Stellarton, whereas the highest monthly average of daily maximum temperature is 23.4°C at Trafalgar and 24.5°C at Stellarton. On the Northumberland Lowlands the average annual soil temperature at a depth of 50 cm is 5.2°C under forest vegetation.

The coastal areas take the brunt of the winds, which are commonly from the west and northwest in winter. Northwesterly winds in spring are frequently responsible for delayed plant growth along the Northumberland Strait shore, and all year they are often twice as strong on the shore as at points inland (Nowland and MacDougall 1973).

An indication of the length of the growing season for most crops is given by the average number of degree days above 5°C; in Pictou County they total 1600-1800 (Fig. 9b), which is comparable with the Prairie Provinces, but 400-700 degree days fewer than southern Ontario.

For practical purposes, the length of the growing season is governed by the occurrence of the latest spring frost and the earliest fall frost. These average and extreme dates of frost and the average frost-free periods are shown in Table 2. The average frost-free period is illustrated in Figure 9c.

In Table 3, frost data for Stellarton are expanded to show the calculated probability of occurrence of frost after certain dates in the spring and before certain dates in the fall.

Table 1. Monthly temperature and precipitation data for representative stations

Mean data	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
						Stellarton							
Daily temp (°C)	-5.8	-6.3	-2.0	3.4	9.3	15.2	18.9	16.1	14.1	8.8	3.9	-2.6	6.3
Daily max temp	-1.2	-1.2	2.3	8.0	14.7	21.0	24.5	23.6	19.6	13.7	7.7	1.7	11.2
Daily min temp	-10.4	-11.3	-6.4	-1.2	3.8	9.3	13.2	12.5	8.4	3.8	0.0	-6.9	1.2
Max temp	14.5	15.6	17.2	22.8	30.6	33.4	34.4	35.0	31.7	25.6	22.8	16.7	35.0
Min temp	-32.8	-39.4	-28.3	-13.9	-6.7	-3.9	1.7	1.1	-3.3	-7.8	-12.8	-30.0	-39.4
Rainfall (mm)	52.0	40.6	39.0	57.9	74.9	70.3	74.5	90.7	73.8	98.2	117.6	70.3	859.8
Snowfall (cm)	47.2	47.1	41.8	15.6	1.3	0.0	0.0	0.0	0.0	1.6	6.1	40.2	200.9
Tot precip (mm)	99.1	87.7	80.8	73.5	76.2	70.3	74.5	90.7	73.8	99.8	123.6	110.5	1060.5
Days with rain	6	5	7	10	12	11	11	11	11	13	14	9	120
Days with snow	10	9	9	4	.	0	0	0	0	.	2	9	43
Days with precip	15	12	14	13	12	11	11	11	11	13	15	17	155
Max precip (24h)	63.8	41.7	40.6	52.8	53.1	71.9	68.8	165.6	58.4	54.6	54.9	51.6	165.6
						Trafalgar							
Daily temp (°C)	-7.3	-7.8	-3.3	2.4	8.1	14.0	17.4	16.8	12.4	7.3	2.4	-4.2	4.9
Daily max temp	-8.1	-1.6	1.9	7.4	14.2	20.5	23.4	23.0	18.9	13.0	6.8	0.8	10.5
Daily min temp	-12.8	-13.9	-8.4	-2.7	2.0	7.4	11.4	10.4	5.8	1.5	-2.0	-9.3	-0.9
Max temp	13.0	13.9	17.5	26.1	32.8	33.3	34.4	29.4	30.6	24.4	20.0	15.0	34.4
Min temp	-30.0	-35.0	-29.4	-18.9	-7.8	-3.3	-1.1	1.7	-5.0	-10.0	-16.1	-31.0	-35.0
Rainfall (mm)	88.1	62.5	68.7	73.1	97.8	91.9	94.3	97.6	93.1	129.2	148.5	107.9	1152.7
Snowfall (cm)	61.7	64.4	56.7	23.9	2.6	0.0	0.0	0.0	0.0	3.3	15.4	56.2	284.2
Tot precip (mm)	149.8	126.9	125.5	97.0	100.4	91.9	94.3	103.2	93.1	132.5	163.9	164.0	1442.5
Days with rain	7	4	7	9	12	11	10	9	10	12	13	8	112
Days with snow	12	10	10	5	1	0	0	0	0	1	4	11	54
Days with precip	16	13	14	12	12	11	10	9	10	13	15	17	152
Max precip (24h)	96.4	67.3	69.3	59.7	57.2	95.8	80.5	100.6	148.6	90.0	111.8	80.5	148.6

Source: Atmospheric Environment Service 1980

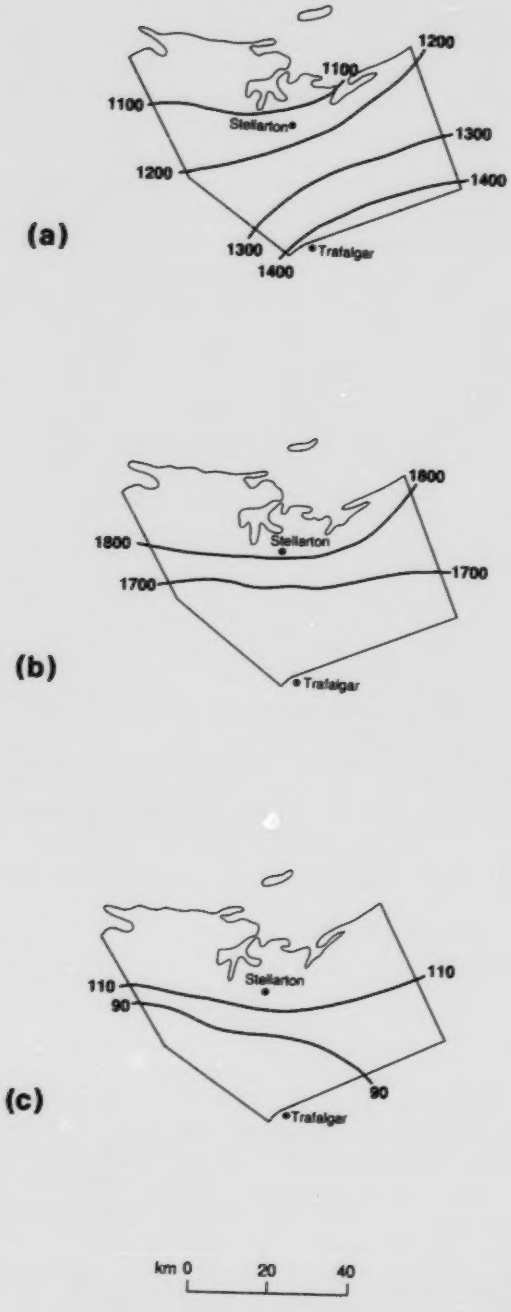

1200
1100
1100
Stellarton
1300
1200
1400
(a)
1300
Trafalgar
1400
1800
1800
Stellarton
1700
1700
(b)
Trafalgar
110
Stellarton
110
90
90
(c)
Trafalgar
km 0
20
40

Fig. 9. Climatic data for Pictou County (from Dzikowski 1983): (a) annual total precipitation (mm); (b) annual total degree days above 5°C; and (c) average frost free period (days).

Table 2. Average and extreme dates of frost and length of frost-free period at representative stations

Station	Elevation (m)	Last frost in spring			Average frost-free period (days)	First frost in fall		
		Earliest	Average	Latest		Earliest	Average	Latest
Stellarton Lourdes	11	May 5	May 31	June 14	112	Sept 1	Sept 21	Oct 9
Trafalgar	152	June 2	June 21	July 3	76	Sept 1	Sept 6	Sept 14

Source: Hemmerick and Kendal 1972.

Table 3. Probability of frost occurrence at Stellarton

Probability of last spring frost occurring on or after dates indicated (years)				Probability of first fall frost occurring on or before dates indicated (years)			
3 in 4	1 in 2	1 in 4	1 in 10	1 in 10	1 in 4	1 in 2	3 in 4
May 19	May 29	June 9	June 18	Sept 3	Sept 11	Sept 19	Sept 29

Source: Canada Department of Transport, Meteorological Branch 1968.

The depth to which frost penetrates the soil and its duration depend upon the amount and duration of snow cover, the texture and moisture content of the soil, and the type of vegetation cover. Well-drained forested soils can freeze to only 5 cm under substantial snow, or up to 90 cm when seasonal snowfall is well below average. Freezing is confined largely to the litter layer in poorly drained forest soils under average snowfall, but can freeze to a depth of 30 cm for several weeks when snow cover is thin or intermittent. In cultivated soils frost can persist for 3 to 5 months in the plow layer. At a depth of 50 cm, it can last for only 1 month in poorly drained soils beneath snow, or 4 months in soil that is well drained and exposed (Nowland and MacDougall 1973).

Vegetation

The natural vegetation of Pictou County is a product of its climate. However some local variations are produced by topographic exposure and by depth, nutrient supply, and drainage status of the soils. Because the indigenous forest has been altered in composition by logging and forest fires, little undisturbed forest remains, and none remains in the lowlands.

Forest covers 217 000 ha, or 75% of the total area of the county. Of this total, 41% is softwood forest, 26% is mixed wood forest, and the remaining 33% is hardwood forest (Nova Scotia Department of Lands and Forests 1982).

Spruces and balsam fir are the most abundant species and together constitute over 88% of the total volume of softwood in the county; much smaller volumes of hemlock, pines, and other softwoods occur in this order. (botanical names are given in Appendix 1). Maple accounts for almost half of the total hardwood volume, followed by aspen, birches, beech, and other hardwoods (Table 4).

Table 4. Volumes of tree species

Softwood species	Volume* (1000 m^3)	% of total	Hardwood species	Volume (1000 m^3)	% of total
White spruce	3 298	16.6	Sugar maple	2 081	10.4
Spruce (red, black)	2 945	14.8	Red maple	1 729	8.7
Balsam fir	4 452	22.3	Yellow birch	1 022	5.1
Hemlock	1 128	5.7	White birch	311	1.6
White pine	142	0.7	Aspen	1 809	9.1
Red pine	97	0.5	Beech	522	2.6
Other softwoods	5		Other hardwoods	370	1.9
Total softwood	12 067	60.6	Total hardwood	7 844	39.4
Total forest volume				19 911	100

* Conversion factor: Cubic metre (m^3) x 0.4527 - cords.
Source: Nova Scotia Department of Lands and Forests 1982.

The Cobequid Upland and the Pictou Highlands are in the Sugar Maple - Yellow Birch - Fir Zone; the Northumberland Lowlands and the Horton Highlands are in the Red Spruce - Hemlock - Pine Zone; and the Pictou Basin, the valleys of the East River St. Mary's and the East River of Pictou of the Horton Highlands, are in the Sugar Maple - Hemlock - Pine Zone (Fig. 10).

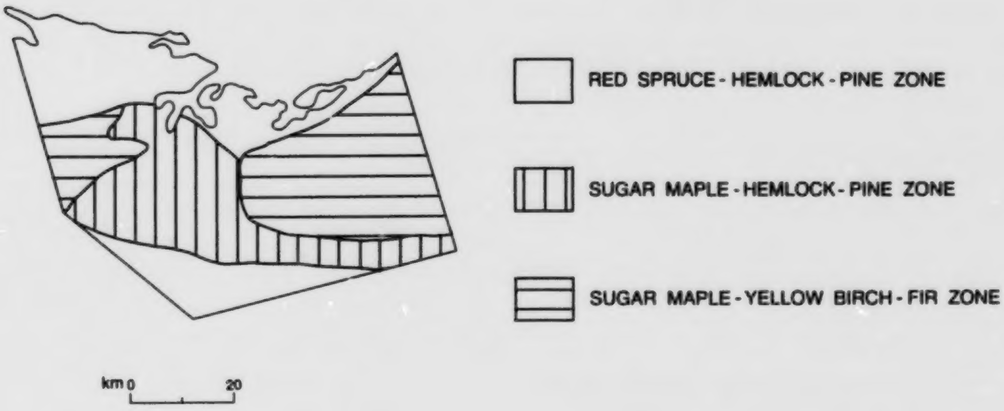

RED SPRUCE - HEMLOCK - PINE ZONE
SUGAR MAPLE - HEMLOCK - PINE ZONE
SUGAR MAPLE - YELLOW BIRCH - FIR ZONE
km 0
20

Fig. 10. Forest vegetation zones of Pictou County (Loucks 1961).

The Cobequid Upland and Pictou Highlands support hardwood, softwood, and mixed wood forest. Hardwood forests of sugar maple, yellow birch, and beech are most abundant on hills and on freely drained upland sites. White spruce, red spruce, and balsam fir form mixed woods with sugar maple, yellow birch, and red maple on steep slopes. Balsam fir, black spruce, white spruce and white pine predominate in the valley bottoms of the Cobequid Upland.

In the Pictou Highlands, red spruce, white spruce, hemlock, and balsam fir are interwoven with the tolerant hardwoods on the upland flats and form coniferous stands on the lower slopes and valley bottoms (Loucks 1961).

An important limiting factor in the Cobequids is exposure to winds and neither red spruce or yellow birch grow well unless sheltered by more tolerant species. Although infertile, the stony soils of the Cobequids possess a slightly higher nutrient status than many soils in the county. This and the broadleaf litter are at least partly responsible for the luxuriant shrub growth in clearings and under hardwoods (Nowland and MacDougall 1973). The competition from quick-growing mountain maple, beaked hazelnut, and hobblebush usually delays hardwood regeneration. Characteristic species of ground flora are wood-sorrel, wood-fern, and shining club-moss. Blueberry is naturally uncommon but is cultivated on abandoned farmland.

The Northumberland Lowlands support a distinctive association of red spruce, black spruce, balsam fir, red maple, hemlock, and white pine. Black spruce is the main species, and tamarack is prominent on large areas of poorly drained soils and wetlands. Jack pine and red pine occur on droughty sands and gravels.

Strong winds along the Northumberland shore affect the forest vegetation, particularly the red spruce. Nevertheless, this species remains abundant, growing best where sheltered. White spruce is more tolerant of wind than red spruce and, because it readily colonizes abandoned farmland it is more plentiful along the coast. Regardless of species, second-growth stands on this area are stunted unless sheltered from the wind. Over much of the lowlands the moist and slowly permeable soils are significant factors affecting growth. This forest association exists on all types of topography except some drier, more exposed upper slopes, which support sugar maple, yellow birch, and beech forest. Red maple and wire birch predominate on old burns.

Abandoned farmland in Pictou County reverts to speckled alder shrubs and white spruce. Alders abound on imperfectly and poorly drained fields that have been neglected, and they choke disused tracks. White spruce thrives on imperfectly to moderately well drained old fields, either as dense stands or in open competition with shrubs (Nowland and MacDougall 1973).

Prominent shrub and herb species of the lowlands include witherod, rhodora, sheep-laurel, sweet-fern, wood-fern, Labrador tea, and wild raspberry. Common herbaceous plants are wintergreen, goldthread, naked miterwort, bunchberry, bristly club-moss, wood-sorrel, and sphagnum and feather mosses.

The Pictou Basin and the East River St. Mary's and East River of Pictou valleys support sugar maple and beech on undisturbed upland sites. Balsam fir, hemlock, white spruce, red spruce, and pine predominate on the steep slopes, in the valleys, and on outwash plains. Intolerant stands of red maple, wire birch, and aspen are prominent on disturbed land. Black spruce is common on poorly drained depressions and flats.

Much of the land in the basin was once cleared, but white spruce has regrown on part of it. This tree grows better on the sheltered slopes of the basin than on the Northumberland Lowlands.

Species of the forest floor that distinguish the Sugar Maple - Hemlock - Pine Zone include dog's-tooth violet, yellow violet, Indian cucumber-root, and false Solomon's seal. These plants are not limited to this zone, but they are more widely distributed in it and contribute to the distinctive nature of the vegetation (Loucks 1961).

PART 2. SOIL FORMATION, CLASSIFICATION, SURVEY, AND MAPPING METHODS

Soil formation

Soil is defined as "the naturally occurring, unconsolidated mineral or organic material at least 10 cm thick that occurs at the earth's surface and is capable of supporting plant growth" (Agriculture Canada Expert Committee on Soil Survey 1987). Soils and the differences between them are produced by the interaction of several factors. The factors of soil formation are climate, organisms (including vegetation), topography, parent materials, and time.

Climatic factors

Climatic factors and microorganisms act upon rocks and parent materials to produce soils. Chemical reactions involved in this weathering process proceed more rapidly under warm moist conditions. Rainfall, especially the amount that exceeds evapotranspiration, is important in determining how quickly the product of weathering, including plant nutrients, are leached out of soils.

The moist, cool climate, by promoting rapid leaching of nutrients and slow replacement of freshly weathered products, is the basic reason for the acidity and infertility of the soils of Pictou County.

The effects of climate and vegetation are interwoven. Climate exerts strong control over vegetation; vegetation modifies the climate at ground level. Climatic factors are partly responsible for an accumulation of organic matter in the soil, because low temperatures during much of the year do not encourage rapid decomposition.

Plant nutrients, taken up at depth within the soil by plant roots, enrich the surface through litter fall. This cycling of nutrients from the soil to the vegetation and back again counters nutrient loss from soil via leaching. Leaching ability, which is governed by the litter, is highest under coniferous and moss litter, somewhat less under hardwoods, and least under grasses. The litter cover also protects the soil from erosion.

Organisms

Organic matter thoroughly incorporated into the mineral soil can produce good structure, which provides the ideal combination of good moisture storage and rapid drainage of surplus water. Such conditions are approached under some deciduous trees and in surface soils under grass, where organic matter provides a source of nitrogen and a substrate for microorganisms. The microorganisms play a vital role in breaking down and in synthesizing readily available plant nutrients. The application of lime not only increases the availability of present nutrients but stimulates a vastly increased microbial population, which helps to release more nutrients.

Lime in combination with organic matter is necessary for a well-structured surface soil and deficiencies of one or the other are the cause of the weak structural aggregation of most cultivated soils in the province.

Coniferous trees drop a needle litter that is not readily digested by most microorganisms, so it decomposes slowly and accumulates on the soil surface. The primary decomposers of coniferous forest litter are fungal organisms. There decomposition by-products are strongly acid and usually create an adverse environment is also adverse to earthworms and arthropods. Thus little of this raw humus, or mor as it is called, is mixed with the mineral soil. Infiltrating water is made more acidic by its reaction with the by-products of fungal decomposition. The resultant soil solution readily leaches out plant nutrients and other bases.

The litter from hardwood trees is more readily digested by soil microorganisms and is usually higher in nutrients than conifer litter. As a result, hardwood litter is more easily decomposed and incorporated into the mineral soil forming partly decomposed humus called moder. Under less acid, more nutrient-rich soil conditions, hardwood litter is consumed and incorporated into the mineral soil very quickly by earthworm activity, producing intimately mixed, humified humus called mull.

Topography

The influence of topography is threefold. With increasing elevation, annual temperature decreases and annual precipitation increases, which, unless countered by other factors, causes greater leaching of upland soils. Aspect, or orientation of a slope in relationship to the warming rays of the sun, affect biological activity and the rate of mineral weathering.

Water collects on level areas and is shed by slopes. On level areas, the degree of gleying or intense leaching, or both, depends on the permeability of the soil and the depth of groundwater. On slopes, even permeable soils are less well developed, because a higher proportion of rainfall is lost as runoff. Such water is not available for leaching but can erode the surface and keep the soil immature and often shallow.

Parent material

Parent material determines the mineral content and, to a large extent, the texture of the soil. It partly governs soil fertility, internal drainage conditions, and color. Physical and chemical weathering together transform rocks into unconsolidated material. Further alteration of minerals and the formation of secondary clay minerals rely increasingly on chemical processes. These processes proceed more rapidly in parent material containing high proportions of less resistant minerals such as the ferromagnesian minerals. Where resistant quartz and orthoclase feldspar are dominant, the soil usually has a fairly coarse texture. In all soils, much depends on whether products of decomposition remain in the soil or are removed in drainage water.

Time

The rate of weathering is highly variable and thus soil formation depends on time. Given time, even resistant minerals break down and soil may develop to great depth. Soils in the surveyed area have developed over the relatively short span of 10 000 years, since the last glaciation. Much initial weathering from rock to unconsolidated material occurred rapidly by glacial action, or by extended preglacial and interglacial weathering under favorable warm, humid conditions. Intense leaching since the last Ice Age has produced fairly mature soils.

The most immature soils in the county are those forming on recent alluvial deposits. These deposits periodically receive fresh material from flooding and remain at a young stage of development (Nowland and MacDougall 1973).

Soil horizons

One important visual indication of soil formation is the development of one or more layers called horizons that extend from the soil surface into the parent material.

A cut or exposure showing the vertical sequence of soil horizons is called a soil profile (Fig. 11). No soil contains all these horizons, but every soil has some of them.

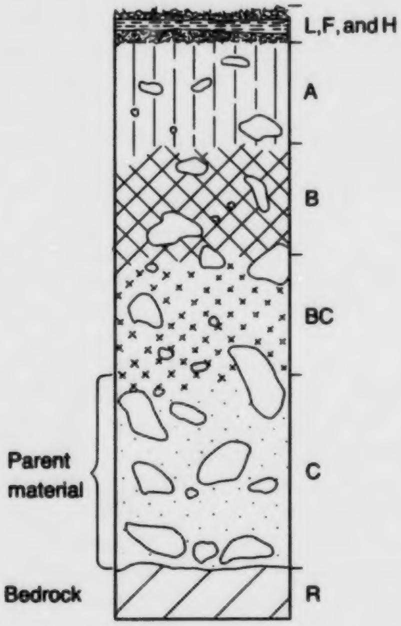


Fig. 11. Hypothetical soil profile.

Each soil has a unique profile that varies in the kind and number of horizons. The horizons may differ from each other in one or more of the following characteristics: color, structure, texture, consistence, reaction, thickness, and in chemical and biological composition. The main soil horizons are designated as A, B, and C for mineral horizons and L, F, H, and O for organic horizons, The characters of these horizons are shown by lower-case suffixes (e.g., Bf); subdivisions of these are shown by attaching Arabic numerals (e.g., Bf1, Bf2). See Agriculture Canada Expert Committee on Soil Survey (1987) for detailed description of the main horizons and the use of the lower-case suffixes and numerals.

L, F, and H. In these organic horizons the organic matter is raw in L, partly decomposed in F, and well decomposed in H.

A. This mineral horizon is at or near the surface. It may be dark brown because of an accumulation of humus (Ah) or gray when clay, iron, and humus have been leached out (Ae). It is usually the horizon most commonly disturbed by human activities, such as cultivation (Ap).

B. This mineral horizon is commonly found below an A horizon. It may be enriched with iron (Bf), with iron and organic matter (Bhf), or with clay (Bt). Where it is only weakly modified or enriched with iron, humus, or clay in amounts insufficient to be called a Bf, Bhf, or Bt, it is labeled a Bm. If saturated for extended period, B horizons show signs of gleying or mottling (Bfg, Btg, Bg). The symbol "j" is used with above suffixes (except "m") to denote a failure to meet the specified limits of the suffix.

BC. This transitional horizon may be gleyed to various degrees (BCg, BCgj) or cemented by the development of a fragipan (BCx, BCxj).

C. This mineral horizon is relatively unaffected by the soil-forming processes that occur in the A and B horizons except for fragipan development and gleying (Cx, Cg).

R. The underlying bedrock may be close to the surface or many metres below it.

Soil forming processes

Several processes take place in the formation of soil horizons:

Accumulation of organic matter. The L, F, and H horizons are organic accumulation of forest litter on the surface of the mineral soil. Under rapid decomposition by soil organisms organic matter can accumulate in the A horizon where most weathering takes place. The formation of Ah horizons commonly occurs in soils under hardwood vegetation in the Cobequid Upland and Pictou Highlands.

Leaching of bases. The intensity of mineral weathering is greatest in the A horizon. Bases are released as minerals are fragmented by weathering processes. Once released to the soil solution, bases are free to be removed by percolating soil water and are leached from the A horizon. The leaching of bases precedes the translocation of silicate clay minerals, sesquioxides and organic matter. Leaching is a prominent soil process occurring in most of the Pictou County soils.

Translocation of silicate clay minerals, sesquioxides, and organic matter. Material weathered and leached from the A horizon is deposited in the B horizon. If the amount of clay translocated to the B horizon is significantly greater than the amount in the A horizon, it is designated as a Bt horizon. The translocation of silicate clay minerals has contributed to the development of horizons in the Luvisols of which some Queens soils are examples. The Bt horizon of some of these soils show clay accumulation as thin films on ped surfaces and in pores.

The removal of iron and organic matter from the A horizon is usually characterized by a gray- to whitish-colored siliceous Ae horizon.

The deposition of significant amounts of iron plus aluminum and organic matter is shown by the addition of the suffixes of f and h to the B horizon. This depositional process is called podzolization and is the predominant soil-forming process in Pictou County; most of the well- to imperfectly drained soils are classified as Podzols.

Reduction and transfer of iron. This process is the result of poor aeration and restricted oxidation and is called gleying. It is indicated by dull, grayish colors or mottling in the horizons, or both. The reddish or yellowish brown mottles in some horizons indicate the segregation of iron by periodic oxidation and reduction in the soil. Gleying is usually most pronounced in poorly drained soils and less pronounced in imperfectly drained soils.

Gleysols are wet soils in which the process of reduction and gleying are strongly expressed.

Other soil characteristics

Important features of soils are color, texture, structure, consistence, and reaction. Color is easily determined and described by using Munsell soil color notations. The range and kinds of colors in soil horizons are usually good indications of organic matter content, drainage, aeration, iron content, and leaching effects. Imperfectly and poorly drained soils are usually mottled with shades of gray, orange, and yellow.

Soil texture refers to the proportions of sand, silt, and clay less than 2 mm in diameter. When coarser soil particles constitute more than 20% of the soil volume, the terms gravelly or very gravelly are used as modifiers of the textural class name. For example, a gravelly loam may have 7-27% clay, 28-50% silt, less than 15% sand by weight, and 20-50% by volume of coarse particles. Very gravelly soils have 50-90% coarse particles by volume. The texture of a soil horizon is considered to be its most nearly permanent feature.

Soil structure is the characteristic of a soil profile that most influences plant growth. The form, size, and durability of the soil aggregates determine pore space, moisture-holding capacity, and distribution of plant roots within the soil mass. A soil horizon may have granular, blocklike, or platelike structure, or it may be structureless (nonaggregated).

Soil consistence refers to the combination of properties of soil materials that determines the resistance to crushing and the ability to be molded or to be changed in shape. Consistence depends mainly on the forces of attraction between soil particles. Depending on the soil moisture content, consistence is described by such words as loose, friable, firm, soft, plastic, and sticky.

Soil reaction is expressed in pH values as a measure of the degree of acidity or alkalinity of a soil mass. It may range from extremely acid (below pH 4.5) to very strongly alkaline (pH 9.1 and higher). Neutral is regarded as being from pH 6.6 to 7.3.

Other soil features, which do not occur in all horizons, are as follows:
- thickness range
- abundance, size, distinctness, and kind of mottles
- percent volume of coarse fragments
- frequency, thickness, and location of clay films
- abundance of surface stones.

Soil classification

Variations in the characteristics of the soil profile are the basis for soil classification. The soils of Pictou County represent six of the nine orders defined in The Canadian system of soil classification (Agriculture Canada Expert Committee on Soil Survey 1987). Each order represents broad differences in soil environments that are related to differences in the processes of soil formation. Usually orders are distinguished by common properties within the order that differ from properties of other orders. The six orders represented in Pictou County are Podzolic, Gleysolic, Luvisolic, Brunisolic, Regosolic, and Organic.

Podzolic soils

Soils of the Podzolic order are rapidly to imperfectly drained and have developed under forest. If undisturbed, Podzols have surface organic horizons (LFH) that may be underlain by a Ah horizon. More commonly they have leached Ae horizons that may be either thick or very thin. The soils have Podzolic B horizons in which iron, aluminum, and organic matter have accumulated. Podzols are typically very acid. Podzols in Pictou County can be further subdivided into Humo-Ferric Podzols, which have Bf horizons and Ferro-Humic Podzols which Bhf horizons.

Gleysolic soils

The soils of the Gleysolic order have developed under poorly drained, anaerobic or oxygen-deficient environments for extended periods throughout the year. They have developed under forest vegetation and may have surface layers of fibric peat up to 60 cm thick. The A and B horizons are dull colored and usually have prominent mottling within 50 cm of the surface. Three great groups exist in Pictou County: Gleysols; Humic Gleysols, which have an Ah at least 10 cm deep; and Luvic Gleysols, which have a Btg.

Luvisolic soils

The soils of the Luvisolic order in Pictou County are imperfectly drained soils that have developed under forest vegetation on medium and moderately fine-textured till and lacustrine parent materials. They have surface organic horizons (LFH) underlain by weak, thin Ae horizons. Below the Ae horizon is a Bmgj horizon that overlays a Btgj horizon; the latter has translocated clay deposited as thin clay films on ped surfaces and faint mottling. Only the Gray Luvisol great group occurs in Pictou County.

Brunisolic soils

The soils of the Brunisolic order are well to imperfectly drained and have developed under forest. These soils lack the degree and kind of development specified for soils of other orders, but have sufficient development to exclude them from the Regosolic order. Brunisolic soils have brownish Bm horizons and may have either an Ah or weakly to strongly developed Ae horizons. The order also includes soils with both Ae or Ah horizons, or both, and weakly expressed B horizons that have only weak accumulations of clay (Btj), or iron, aluminum, and organic compounds (Bfj), or both. Two great groups exist in Pictou County: Sombric Brunisols, which have an Ah; and Dystric Brunisols, which lack an Ah.

Regosolic soils

The Regosolic order includes those soils with horizon development too weak to meet the requirements of other orders. In Pictou County these soils are well to imperfectly drained and have been prevented from maturing and developing B horizons by periodic flooding by river or tidal waters. Both the Regosol and Humic Regosol great group are present in the county.

Organic soils

The organic order includes those soils that have developed mainly from organic deposits. They contain greater than 30% organic matter and are usually saturated during most of the year. The Fibrisol and Mesisol great groups occur in the county.

Further subdivisions of the great groups into subgroups provides the most detailed level of soil classification used in describing the map units in this report. Subgroups are distinguished by the presence of certain diagnostic horizons.

For further information on classifying soils at the subgroups level refer to The Canadian system of soil classification (Agriculture Canada Expert Committee on Soil Survey 1987).

Survey methods

Black-and-white 1:50 000 aerial photographs and 1:50 000 topographic maps were used to locate and record soil inspections in the field. Soil survey crews traveled the county roads systematically stopping every 500-750 meters to examine the soil. Four-wheel drive vehicles were used to access forest roads. At each site a soil pit or road cut was examined to a depth of about 1 m. The site and soil profile were described and documented using the standards and guidelines presented in the CanSIS Manual for describing soils in the field (Day 1983). Taxonomically the soils were classified according to The Canadian system of soil classification (Agriculture Canada Expert Committee on Soil Survey 1987).

Where roads are numerous, accessibility was good and soil observations were plentiful (Fig. 12). In these areas mapping reliability can be expected to be higher than in areas with few roads.

Soil map unit boundaries were drawn on the aerial photos in the field, where possible. However, because much of the area is forested, most soil boundaries were located using stereoscopic photo interpretation. This interpretation was supported by soil inspections at 3300 site locations throughout the county.

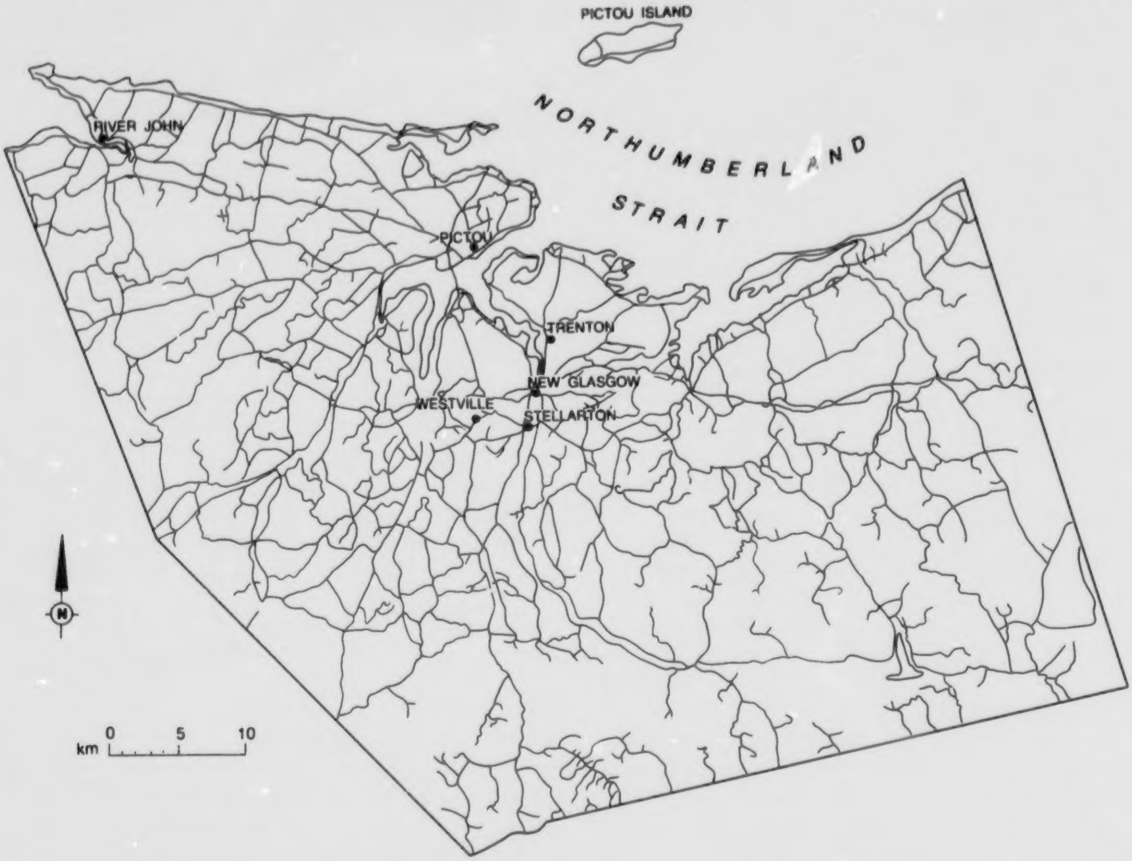

PICTOU ISLAND
NORTHUMBERLAND
STRAIT
RIVER JOHN
PICTOU
TRENTON
NEW GLASGOW
WESTVILLE
STELLARTON
N
km 0 5 10

Fig. 12. Vehicle accessibility map.

All major soils were described, sampled, and analyzed. The methods used follow those found in the Manual on soil sampling and methods of analysis (McKeague 1978). The analytical method numbers from McKeague (1978) are indicated in parentheses:

- particle size analysis by the pipet method (2.11)
- pretreatments to remove organic matter, iron oxides and carbonates(2.111)
- bulk density by the core method (2.21) (in soils too gravelly to core, bulk density was estimated by using the Volumeasure)
- saturated hydraulic conductivity by the core method (2.51)
- liquid limit (2.61)
- plastic limit (2.62)
- plastic index (2.63)
- pH in $CaCl_2$ (3.11)
- pH in water (3.13)
- extractable Fe and Al by dithionite (3.51); by oxalate (3.52); by pyrophosphate (3.53)
- extractable Mn by dithionite (3.51)
- organic carbon by wet oxidation (3.613)
- total N (3.621).

The analytical soil data and corresponding profile descriptions are presented in Appendix 2, and the terms and abbreviations used there are defined in Appendix 3.

Engineering data and estimates of the Unified and AASHO classifications have been compiled for the soil parent materials and are presented in Table 4-3 of Appendix 4.

Mapping methods

All individual soils described in the field have been grouped into 21 soil associations. A soil association includes all soils developed from similar parent materials. The origin, color, textural range, of the parent material of each soil belonging to a specific association must be similar. The soil association is usually named after the geographic location where it was first mapped. Many of the soil association names from the Soil Survey of Pictou County (Cann and Wicklund 1950) have been used in this report, some have been dropped or combined, and some new associations have been created.

Within an association variations in soil drainage may alter the profile characteristics and limitations for use of the soil. Soils within an association having similar drainages are grouped into well, imperfect, and poorly drained associates.

The soil associate is the basic mapping unit used in mapping the soils of Pictou County and has been used singly or in combination with other associates.

In simple map units only the dominant associate has been mapped; it occupies about 85% of the map unit. These units are numbered 1, 3, and 5 on the map and in the legend.

In the survey area, soil, drainage, and soil associations can change abruptly over very short distances within the landscape. In these complex areas compound map units are used to present a more accurate picture of the soil distribution. Compound map units are composed of a dominant associate component and a significant associate component. The dominant component occupies about 60% of the map unit and the significant component at least 25%. These units are numbered 2, 4, 6, 7, and 8 on the map and in the legend.

The other 15% of simple map units and the 15% or less in compound map units are inclusions. Inclusions are unnamed and undescribed soils components of map units. Inclusions may be soils that are named and have their own map units elsewhere in the survey area or they may be rare and insignificant soils that are not recognized and named at all in the survey (Mapping System Working Group 1981).

The soil map symbol is composed of the mapping unit symbol in the numerator and dominant slope class for the unit in the denominator.

PART 3. SOIL ASSOCIATIONS AND MAP UNITS

BARNEY ASSOCIATION (By)

Parent material and landform

Barney soils have developed in 50-70 cm of friable, gravelly loam to silt loam over firm, strongly acidic, olive to olive gray, gravelly loam glacial till. The till is derived from Silurian shales of the Arisaig Group and contains 20-40% shaly gravel and flagstones.

Barney soils are moderately stony and non- to slightly rocky, and are found on rolling to hummocky till blankets and veneers on very gentle to strong slopes (2-30%).

Location and extent

Soils of the Barney Association are found principally on the western half of the Pictou Highlands along the boundary with the lowlands. Large areas are located north of North Meiklefield, south of Irish Mountain, and north of Sunnybrae. Barney soils cover 13 019 ha or 4.7% of the county.

Soil characteristics

Under forest, Barney soils have 3-10 cm of extremely acidic, poorly decomposed mor humus (see Appendix 2, Table 2-1 and Fig. 13). This organic mat is underlain by 50-70 cm of friable gravelly loam to gravelly silt loam containing 20-45% shale fragments. The subsoil can be quite variable. If the soil is shallow over bedrock, the subsoil contains a high volume of shale fragments that increase with depth until shattered shale bedrock is reached. These Barney soils are usually located on well drained steep upper slopes and hill tops. Where the till is deep the subsoil is compact and slowly pervious and the content of shale fragments is greatly reduced. These Barney soils are usually located on lower slopes and in depressions and they have imperfect drainage.

Associated soils

On the Pictou Highlands, Barney soils are most frequently associated with Millbrook and Kirkmount soils. Kirkmount soils are shallower and more stony than Barney soils. Millbrook soils are finer-textured, deeper, and have developed on reddish brown till. In the northern section of the Pictou Highlands, Barney soils are associated with Thom soils, which are similar in texture but contain sedimentary and metamorphic coarse fragments and have developed on yellowish brown till.

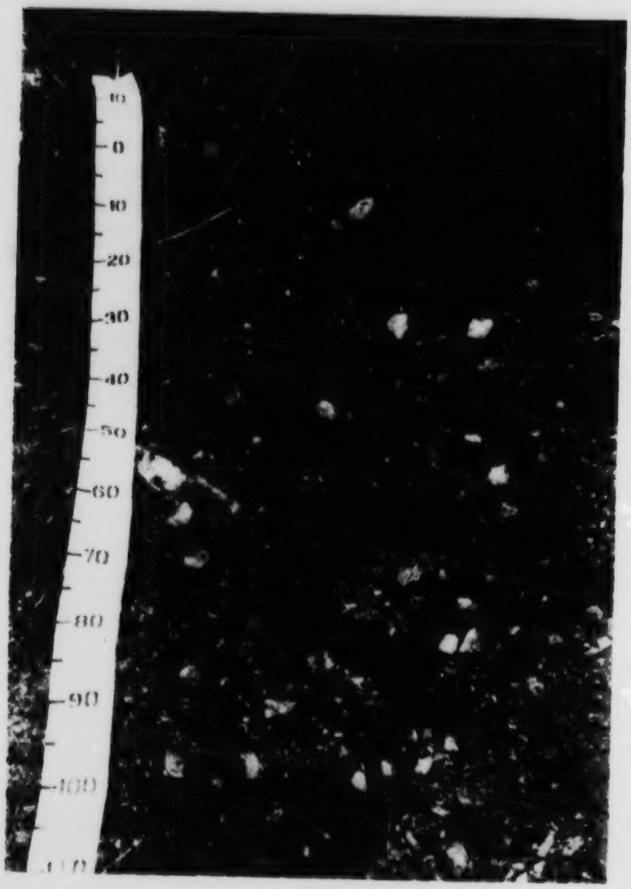


Fig. 13. Barney soil profile.

Map units

Three map units have been established for the Barney Association.

By1 (24 areas: 3110 ha). By1 map units are composed of moderately well-drained Orthic Humo-Ferric Podzols. These units are located on upper slope positions and have good surface drainage. By1 units are moderately stony and slightly rocky.

By2 (15 areas: 8563 ha). By2 map units are composed dominantly of moderately well-drained Orthic Humo-Ferric Podzols (By1 units), with significant inclusions of Gleyed Humo-Ferric Podzols (By3 units). These units have hummocky topography. The By3 components are located in the depressions and on the lower slopes and the By1 components are found on the lower slopes. By2 units are moderately stony and nonrocky.

By3 (14 areas: 1346 ha). By3 map units are composed of imperfectly drained Gleyed Humo-Ferric Podzols. They are located on gentle topography with restricted surface drainage and in depressions that receive surface runoff and subsurface seepage from the surrounding upland. By3 units usually have deeper soils and more impervious subsoils than soils in By1 units.

BRYDEN ASSOCIATION (Br)

Parent material and landform

Bryden soils have developed in 60-80 cm of friable, gravelly loam to gravelly sandy loam over compact, very strongly acidic, dark brown to dark yellowish brown, gravelly loam till. The till is derived from Horton siltstone and sandstone, and contains from 20-30% gravel and cobbles.

Bryden soils are moderately to very stony and non rocky and are found on undulating to rolling till plains on very gentle to gentle slopes (2-9%) (Fig. 14).

Location and extent

Soils of the Bryden Association are found on the Horton Highlands. The largest areas are northwest of Trafalgar and south of McKinnon Lake. Smaller areas are located on the eastern end of the highlands. Bryden soils cover 7945 ha or 2.9% of the county.

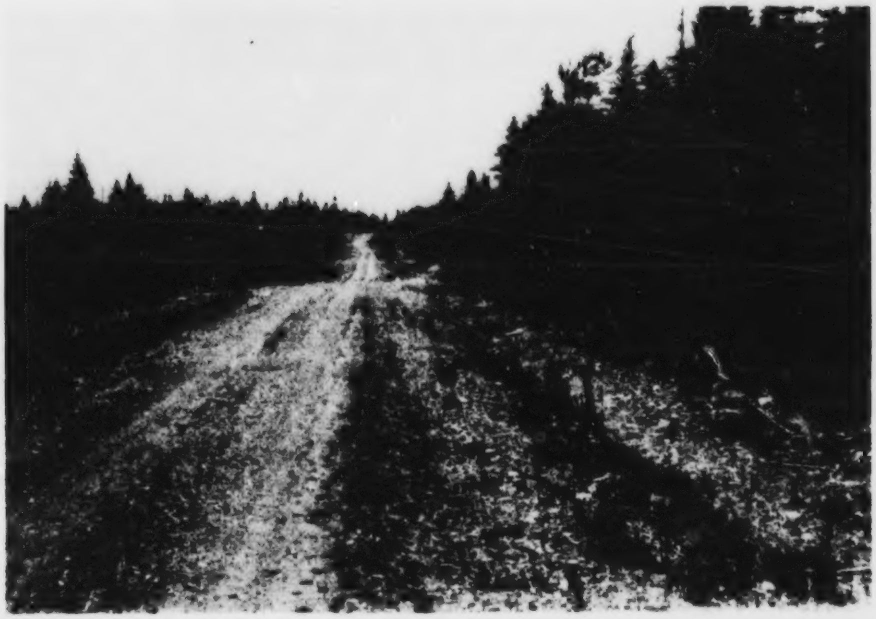


Fig. 14. Bryden soil landscape.

Soil characteristics

Under conifer forest, Bryden soils have 5-12 cm of very strongly acidic, poorly decomposed, mor humus (see Appendix 2, Table 2-2 and Fig. 15). Underlying this organic mat is 60-80 cm of friable, gravelly loam to gravelly sandy loam over compact gravelly loam material. The friable material typically contains 20-35% gravel and cobbles of hard siltstone and sandstone. The parent material has moderately slow permeability and retards internal drainage, causing perched water tables during wet periods of the year.

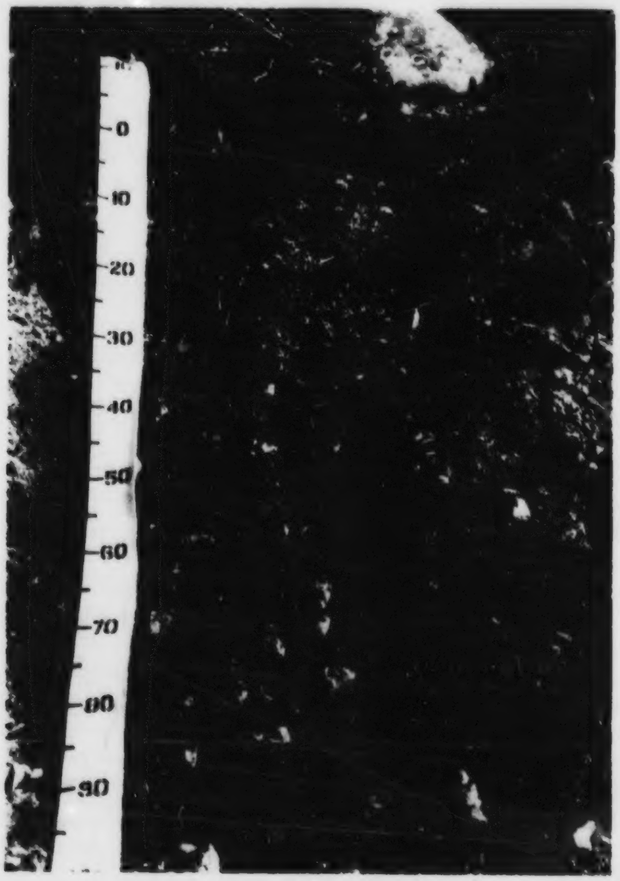


Fig. 15. Bryden soil profile.

Associated soils

Bryden soils are intermediate in character between the shallow stony Perch Lake soils and the deep heavy loam to clay loam Millbrook soils. All three soils are found closely associated on the Horton Highlands with each other and with the organic Castley soils, which are well distributed across the highlands.

Map units

Four map units have been established in the Bryden Association.

Br1 (6 areas: 877 ha). Br1 map units are composed of moderately well-drained Orthic Humo-Ferric Podzols and are located on upper slope positions. These map units have good surface drainage and are moderately to very stony and nonrocky.

Br2 (15 areas: 4891 ha). Br2 map units are composed dominantly of moderately well-drained Orthic Humo-Ferric Podzols (Br1 units), with significant inclusions of imperfectly drained Gleyed Humo-Ferric Podzols (Br3 units). Br2 units are moderately to very stony and nonrocky.

Br3 (11 areas: 831 ha). Br3 map units are composed of imperfectly drained Gleyed Humo-Ferric Podzols. These units are located on very gentle slopes that have restricted surface drainage. They are also found on lower slopes that receive abundant subsurface seepage, which keeps them saturated for extended periods of time. Br3 units are moderately to very stony and nonrocky.

Br4 (14 areas: 1346 ha). Br4 map units are composed dominantly of imperfectly drained Gleyed Humo-Ferric Podzols (Br3 units), with significant inclusions of poorly drained Orthic Gleysols. These units are located in depressions and adjacent to slopes that receive excess surface and subsurface water from adjacent upland. Black spruce - sphagnum forest vegetation is commonly associated with these units. Br4 map units are moderately to very stony and nonrocky.

CASTLEY ASSOCIATION (Ct)

Parent material, landform, and soil characteristics

Castley soils have developed in 40-60 cm of poorly decomposed peat over 50-150 cm of moderately decomposed peat of mixed origin over mineral material. These organic materials are extremely to very strongly acidic, and are found on level to nearly level basin bogs, domed bogs, stream fens, and stream swamps. Peat depths generally range from 40 cm at the mineral edges surrounding the peatlands to 200 cm near the centers. On larger basin and domed bogs, peat depths can exceed 2-3 m near their centers (Fig. 16). Bogs typically have poorly decomposed sphagnum peat overlying poorly to moderately decomposed fen or forest peat. Domed bogs have very thick deposits of poorly decomposed sphagnum peat covering the dome. Bogs are found in very poorly drained depressions and basins and are associated with stunted black spruce, ericaceous shrubs, and sphagnum moss vegetation.

Fig. 16. Castley soils on a basin bog covered with sphagnum moss and ericaceous shrubs.

Stream fens are found adjacent to meandering slowly flowing streams and are composed of 40-100 cm of poorly to moderately decomposed sedge peat overlying fine alluvial sediments (Fig. 17). Stream fens are commonly associated with bogs, which are more removed from the streams and are not influenced by their nutrient-rich waters. Fens are associated with sedge, spruce, and stunted tamarack.

Stream swamps are located in depressions and channels with standing or gently flowing waters of ephemeral streams and are composed of 40-100 cm of moderately decomposed forest peat overlaying strongly gleyed glacial till. Swamps are associated with dense forest, tall shrub, and luxuriant herb vegetation.

Location and extent

Soils of the Castley Association are found predominantly on the northwestern section of the Northumberland Lowlands and on the Horton Highlands. Small pockets are associated with soils on the Pictou Highlands and near the western edge of the Pictou Basin. Castley soils cover 2426 ha or less than 1% of the county.

Fig. 17. Castley soils developed in sedge peat on stream fens.

Associated soils

On the Northumberland Lowlands, Castley soils are associated with Queens, Pugwash, Hansford, Shulie, and Stewiacke soils.

On the Horton Highlands, Castley soils are associated with Perch Lake, Bryden, Hebert, Millbrook, and Stewiacke soils.

Castley soils are associated with Thom, Woodbourne, and Stewiacke soils in the Pictou Basin and Wyvern soils in the Pictou Highlands.

Map units

One map unit has been established in the Castley Association.

Ct (97 areas: 2426 ha). The Ct map unit is composed of very poorly drained Typic and Terric Fibrisols, and Fibric Mesisols on bogs; Fibric, Terric and Cumulo Mesisols on fens; and Fibric, Terric, and Humic Mesisols on swamps. All peatland types have been grouped and mapped as the Ct map unit. Peatlands cover only a small area in Pictou County and are commonly intermixed with each other making it impossible to map them separately at 1:50 000 scale.

The Ct map unit has level to nearly level slopes (0-2%) and is located in very poorly drained depressions and channels and adjacent to meandering streams. The Ct unit is nonstony and nonrocky.

COBEQUID ASSOCIATION (Cd)

Parent material and landform

Cobequid soils have developed in 50-70 cm of friable, gravelly sandy loam to gravelly loam over compact, strongly acidic, dark yellowish brown, gravelly to very gravelly sandy loam till. This material is derived from a mixture of igneous and metamorphic rocks from the underlying bedrock. The till is shallow and contains abundant gravels, cobbles, and stones, which increase in abundance with depth and contribute to the porous nature of the subsoil.

Cobequid soils are very stony and non- to moderately rocky and are found on rolling to hummocky till veneers and blankets, that conform to the shape of the underlying bedrock. Cobequid soils found predominantly on very gently to moderate slopes; however, in the Dalhousie area, they are found on strongly sloping ravines and mountain valleys.

Location and extent

Soils of the Cobequid Association are found in the Cobequid Upland around Dalhousie Mountain and in the Pictou Highlands in the southeastern corner of the county. They cover 18 238 ha or 6.6% of the county.

Soil characteristics

Under forested vegetation Cobequid soils have an extremely acidic humus layer, 3-20 cm thick (see Appendix 2, Table 2-3 and Fig. 18). Humus forms are variable and range from thin, well-decomposed mull to thicker, more poorly decomposed, moder and mor types. Below the surface organic horizon, 50-70 cm of friable material overlies the compact subsoil. This friable material ranges in texture gravelly sandy loam to gravelly loam. Under hardwood or mixed wood vegetation the amount of organic matter into the surface mineral soil can be significant under mull and moder types. Organic carbon is frequently more than 5% in the B horizons of well and imperfectly drained soils. The high organic matter content leaves the B horizon very friable and porous.

Coarse fragment content ranges from 20-60% by volume. The higher levels are most common in soils with bedrock close to the surface.

Associated soils

Cobequid soils are associated with Westbrook soils in the Cobequid Upland, with Kirkmount and Millbrook soils in the Pictou Highlands, and with Wyvern soils in both the Cobequid Upland and Pictou Highlands.

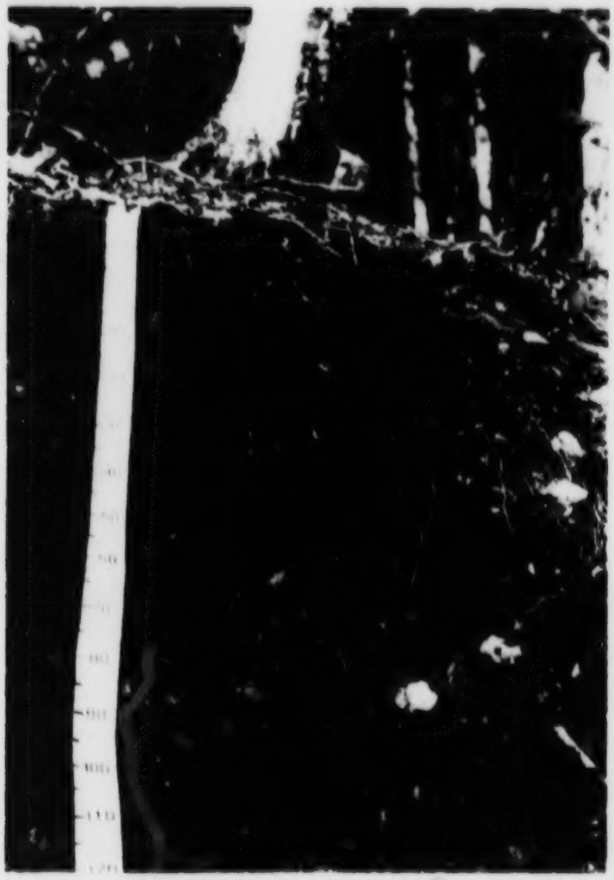


Fig. 18. Cobequid soil profile.

Map units

Five map units have been established in the Cobequid Association.

Cd1 (37 areas: 7460 ha). Cd1 map units are composed of well-drained Orthic Ferro-Humic Podzols, Sombric Ferro-Humic Podzols, Sombric Humo-Ferric Podzols and Orthic Humo-Ferric Podzols. These map units are very stony and range from slightly to moderately rocky. They are commonly located on upper slope positions with good surface drainage. These units are commonly associated with hardwood forest composed of sugar maple, yellow birch and beech.

Cd2 (19 areas: 8762 ha). Cd2 map units are dominantly composed of well drained Orthic Ferro-Humic Podzols, Sombric Ferro-Humic Podzols, Sombric Humo-Ferric Podzols and Orthic Humo-Ferric Podzols (Cd1 units), with significant inclusions of imperfectly drained Gleyed Sombric Ferro-Humic Podzols (Cd3 units).

The landform of the Cd2 units is a series of gentle hummocks with the imperfectly drained soils located in the depressions and the well drained soils located on the knolls and upper slope positions. The depressions receive seepage from the Cd1 units upslope. The vegetation is a patchwork of hardwood forest on the Cd1 units and mixed or softwood forest in the imperfectly drained depressions (Cd3 units). Cd2 units are very stony and slightly to moderately rocky.

Cd3 (7 areas: 1194 ha). Cd3 map units are composed of imperfectly drained Gleyed Sombric Ferro-Humic Podzols, which are very stony and slightly rocky. These units are located on mid to lower slope positions that receive runoff or seepage from upslope areas. These units are usually associated with mixed wood or conifer forest.

Cd4 (3 areas: 477 ha). Cd4 map units are composed dominantly of imperfectly drained Gleyed Sombric Ferro-Humic Podzols (Cd3 units) with significant inclusions of poorly drained Orthic Humic Gleysols and Orthic Gleysols (Cd5 units). These units are very stony and slightly rocky and are located in poorly drained depressions that receive abundant surface runoff and seepage from the surrounding uplands. Conifer forest with a significant component of black spruce is typical for this unit.

Cd5 (5 areas: 345 ha). Cd5 map units are composed of poorly drained Orthic Humic Gleysols and Orthic Gleysols which are very stony and nonrocky. These units are located on very gentle lower slopes and depressions and are frequently associated with lakes or wetlands. Black spruce - sphagnum forest is the common vegetation for these map units.

CUMBERLAND ASSOCIATION (Cm)

Parent material and landform

Cumberland soils have developed in 30-80 cm of friable sandy loam to loam over strongly acid, sand and gravel alluvium. The underlying sand and gravel material is loose and frequently stratified. Cumberland soils are found on level to very gently sloping (0-5%) floodplains and are nonstony and nonrocky.

Cumberland soils are prone to flooding. Cold air drained from upland areas commonly collects on the valley floor, creating frost pockets over Cumberland soils and reducing the frost-free period.

Location and extent

Cumberland soils are found along stream courses and river valleys throughout the county. They cover 4213 ha or 1.5% of the county.

Soil characteristics

Cumberland soils are young soils and show little profile development (see Appendix 2, Table 2-4). However, a distinct layering of flood-deposited sediments, commonly of different textures, is a noticeable feature. Under forested conditions a thin organic litter layer may be present. In locations that are flooded frequently, this layer may be buried or washed away. Cumberland soils are characterized by 30-80 cm of sandy loam to loam sediments over much coarser sand and gravel alluvium, which may be stratified.

The periodic replenishment of nutrients in flood-deposited sediments counters nutrient losses by leaching. Therefore Cumberland soils are slightly more fertile and less acidic than upland soils (see Appendix 2, Table 2-4). Cumberland soils are porous and fertile and support a productive forest rich in understory species.

Associated soils

Cumberland soils are commonly associated with Hebert soils and differ in texture from the silt loam and silty clay loam alluvial soils of the Stewiacke Association.

Map units

Three map units have been established in the Cumberland Association.

Cm3 (30 areas: 1620 ha). Cm3 map units are composed of imperfectly drained Gleyed Regosols and Gleyed Cumulic Regosols. Although Cumberland soils are porous, high water levels in the rivers and streams maintain high water tables in the soils for a significant period during the growing season. Cm3 units are nonstony and nonrocky.

Cm4 (14 areas: 2168 ha). Cm4 map units are composed dominantly of imperfectly drained Gleyed Regosols and Gleyed Cumulic Regosols (Cm3 units), with significant inclusions of poorly drained Rego Gleysols and Rego Humic Gleysols (Cm5 units). These units are located in slowly drained depressions where high water table are maintained for significant periods of the growing season by the river or by runoff from the adjacent upland. Cm4 units are nonstony and nonrocky.

Cm5 (9 areas: 425 ha). Cm5 map units are composed of poorly drained Rego Gleysols and Rego Humic Gleysols. These units are located in slowly drained depressions that remain wet for most of the growing season. Cm5 units are nonstony and nonrocky.

HANSFORD ASSOCIATION (Hd)

Parent material and landform

Hansford soils have developed in 40-60 cm of friable sandy loam to gravelly sandy loam over compact, very strongly acidic, reddish brown, gravelly sandy loam to gravelly loam glacial till. This material is derived from red and gray Carboniferous sandstones and contains 20-35% gravel and small cobbles.

Hansford soils are moderately to very stony and nonrocky and are found on rolling to undulating till plains on very gentle to gentle slopes (2-9%).

Location and extent

Soils of the Hansford Association are found on the Northumberland Lowlands at elevations below 160 m and within 13 km of the ocean. A large area of Hansford soils stretches from Sundridge in the north to West River in the south. Other significant areas are located northeast of Pictou and north of Trenton. Hansford soils cover 15 405 ha or 5.6% of the county.

Soil characteristics

Under conifer or mixed wood forest, Hansford soils have 5-10 cm of poorly decomposed, extremely acidic mor (see Appendix 2, Table 2-5 and Fig. 19). This organic layer is thickest on poorly drained soils. Under this organic layer is 40-50 cm of extremely to very strongly acidic, friable gravelly sandy loam to gravelly loam material. Below this friable upper soil material lies a compact gravelly loam to gravelly sandy loam till subsoil. This subsoil has moderately to moderately slow permeability. The slower permeabilities are found in the imperfectly and poorly drained soils in which the compacted subsoil causes perched water tables in the spring, late fall, and early winter months. In these soils, a fragipan layer frequently occurs above the basal till.

Associated soils

Hansford soils are intermediate in character between the very stony Shulie soils and the relatively stone-free Pugwash soils. Hansford soils have characteristics of both, but they resemble a gravelly, stony Pugwash soil in appearance. Shulie soils are more yellowish and contain greater amounts of stones and cobbles than the Hansford soils. The Hansford till is deeper than the Shulie till and has no rock outcrops.

When associated with Queens soils, the Hansford till may approach 18% clay content.

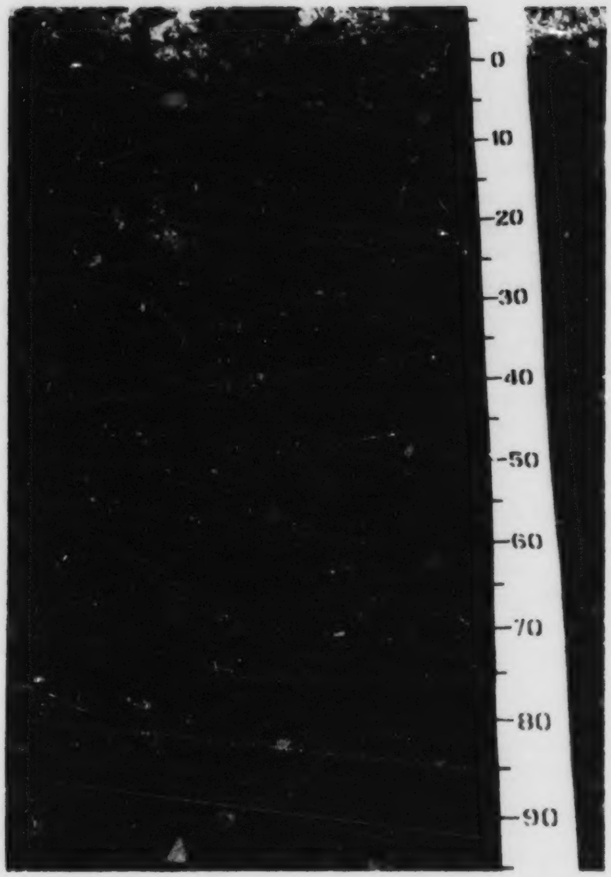


Fig. 19. Hansford soil profile

Map units

Four map units have been established in the Hansford Association.

Hd1 (10 areas: 1300 ha). Hd1 map units are composed of well drained Orthic Humo-Ferric Podzols. These units are located principally on upper slope positions that have good surface and internal drainage. Fragipans are absent or weakly expressed. Hd1 map units are moderately to very stony and nonrocky.

Hd2 (22 areas: 5679 ha). Hd2 map units are composed dominantly of well drained Orthic Humo-Ferric Podzols (Hd1 units) with significant inclusions of imperfectly drained Fragic Humo-Ferric Podzols (Hd3 units). Hd2 map units are moderately to very stony and nonrocky.

Hd3 (23 areas: 7119 ha): Hd3 map units are composed of imperfectly drained Fragic Humo-Ferric Podzols. The soils in these units have well-developed fragipans. Hd3 map units are found on mid to lower slope positions that have restricted surface drainage. Hd3 map units are moderately stony and nonrocky.

Hd4 (1 area: 70 ha). Hd4 map units are composed dominantly of imperfectly drained Gleyed Humo-Ferric Podzols and Fragic Humo-Ferric Podzols (Hd3 units) with significant inclusions of poorly drained Orthic Gleysols (Hd5 units). These units are located in depressions and on lower slope positions that receive seepage and surface runoff. Hd4 units remain wet for significant periods throughout the growing season. Hd4 map units are moderately stony and nonrocky.

Hd5 (17 areas: 1237 ha). Hd5 map units are composed of poorly drained Orthic Gleysols and Humic Gleysols. These units are located in poorly drained depressions that remain saturated throughout most of the growing season. Hd5 map units are moderately stony and nonrocky.

HEBERT ASSOCIATION (He)

Parent material and landform

Hebert soils have developed in 40-60 cm of friable gravelly loamy sand to gravelly loam over loose, strongly to extremely acidic, glaciofluvial sands and gravels. This material is derived principally from hard igneous and metamorphic rocks washed by glacial meltwaters from their source in the Cobequid Upland and Pictou Highlands. These materials have been deposited as kames, kame terraces, eskers, outwash plains, deltas, and valley bottom deposits and are frequently sorted and stratified. The outwash landforms are undulating to rolling with slopes less than 9%. The hummocky or mounded kames and sinuous esker ridges have moderate to strong slopes. Hebert soils are slightly stony and nonrocky.

Location and extent

Hebert soils are scattered throughout the county. The largest area occurs near Lower Barneys River and extends to Avondale and up the Piedmont Valley. Other significant areas exist southwest of Lorne, at Watervale, Broadway, and near the southern tip of the county. Hebert soils cover 12 692 ha or 4.6% of the county.

Soil characteristics

Under forested vegetation Hebert soils (see Appendix 2, Table 2-6) have a thin (<5 cm) poorly decomposed, extremely acidic, layer of mor. Below this organic mat is 40-60 cm of very strongly acidic, friable gravelly loam to gravelly loamy sand, which overlays loose glaciofluvial sands and gravels. Hebert soils are highly porous and have rapid internal drainage. Occasionally slowly permeable loamy layers are bedded above or within the gravelly subsoil and restrict internal drainage.

Associated soils

Hebert soils on deltaic and valley bottom deposits are frequently associated with alluvial soils of the Cumberland and Stewiacke associations.

Map units

Five map units have been established in the Hebert association.

He1 (98 areas: 3915 ha). He1 map units are composed of rapidly and well drained Orthic Humo-Ferric Podzols. These units are slightly stony and nonrocky.

Deep He1 map units are highly prized as a source of aggregate for road building and surfacing and as an ingredient in concrete. Throughout Pictou County numerous pits have been opened to supply the aggregate needs for the area (Fig. 20). Concrete and asphalt production require that only high-quality material be used. Asphalt aggregates are supplied from the Brookland - Six Mile Brook - Fourmile Brook area and Broadway. Blend sand used in asphalt production has been extracted at Meiklefield and Barneys River Station. Concrete aggregate is also mined from the latter location (Fowler and Dickie 1977).

He1 map units tend to be droughty in dry summers but Hebert soils with deep gravelly sandy loam to gravelly loam surface layers can produce respectable yields for some crops.

He2 (32 areas: 3196 ha). He2 map units are composed dominantly of rapidly to well drained Orthic Humo-Ferric Podzols (He1 units), with significant inclusions of imperfectly drained Gleyed Humo-Ferric Podzols (He3 units). These map units are slightly stony and nonrocky.

Fig. 20. Aggregate excavation of Hebert soil material.

He3 (6 areas: 364 ha). He3 map units are composed of imperfectly drained Gleyed Humo-Ferric Podzols. These map units commonly occur in depressional to level areas that are underlain by slowly permeable material, which reduce internal drainage and cause perched water tables during wetter periods. He3 map units are slightly stony and nonrocky.

He5 (4 areas: 142 ha). He5 map units are composed of poorly drained Orthic and Humic Gleysols. These map units occur in depressional to level areas that are underlain by slowly permeable material, which reduce internal drainage and cause perched water tables that saturate the soil for prolonged periods during the growing season. He5 units are usually associated with black spruce - sphagnum forest and wetland vegetation. High water tables persist throughout the year receding for a short period in the summer. He5 units are slightly stony and nonrocky.

He8 (59 areas: 5075 ha). He8 map units are composed dominantly of rapidly to well drained Orthic Humo-Ferric Podzols (He1 units), and significant inclusions of imperfectly drained Gleyed Regosols and poorly drained Rego Gleysols of the Cumberland Association (Cm4 map units). He8 map units are located in valley bottoms. The alluvial Cumberland soils are situated on the floodplain adjacent to the river. The Hebert soils are found on the valley bottom deposits and kame terraces on the lower slopes adjacent to the floodplain. He8 map units are slightly stony and nonrocky.

HOPEWELL ASSOCIATION (Hp)

Parent material and landform

Hopewell soils have developed in 60-150 cm of friable gravelly silt loam to very gravelly loam till over reddish brown Carboniferous sandstone bedrock (Fig. 21).

Hopewell soils are very stony and non to slightly rocky. They are found on very gentle to moderate slopes (2-15%) on undulating to rolling bedrock-controlled till veneers and blankets.

Location and extent

Soils of the Hopewell Association are found principally in the Pictou Basin region of the Northumberland Lowlands in small pockets near Hopewell, Sutherlands River, McLellan Brook and Springville. They cover 5308 ha, or 1.9% of the county.

Soil characteristics

Under mixed wood forest, Hopewell soils have mor and moder surface organic layers (see Appendix 2, Table 2-7). Litter layers range from 1-6 cm thick and overlie loamy Ah horizons, 5-20 cm thick, that are rich in organic matter and containing sandstone, gravel, cobbles, and flagstones. Below the Ah horizon lies a friable, porous, very gravelly silt loam to gravelly loam Bf horizon. Dark reddish brown BCg and Cg horizons frequently lie below the Bf horizon in imperfectly drained soils.

Well drained soils are usually shallower than imperfectly drained soils and have Bf horizons that grade into shattered reddish brown sandstone bedrock.

Fig. 21. Hopewell soils are frequently shallow to bedrock.

Associated soils

Hopewell soils represent a coarser textured, shallower variant of the Woodbourne Soil Association. Both associations have developed on tills that are derived from similar bedrock groups. Hopewell soils are commonly associated with till veneers located on hilltops and upland areas within Woodbourne soil landscapes.

Map units

Two map units have been established in the Hopewell Association.

Hp1 (13 areas: 2346 ha). Hp1 map units are composed of well drained Sombric Humo-Ferric Podzols and Orthic Humo-Ferric Podzols on upper slope positions having good surface drainage. Hp1 units are very stony and non to slightly rocky.

Hp2 (10 areas: 2962 ha). Hp2 map units are composed dominantly of well drained Sombric Humo-Ferric Podzols and Orthic Humo-Ferric Podzols (Hp1 map units) with significant inclusions of imperfectly drained Gleyed Sombric Humo-Ferric Podzols and Gleyed Humo-Ferric Podzols. These units are commonly found on deeper till veneers with gently rolling or hummocky topography. Imperfectly drained soils are usually located in depressions and on lower slope positions. Hp2 units are very stony and non to slightly rocky.

JOGGINS ASSOCIATION (Jg)

Parent material and landform

Joggins soils have developed in 25 cm of loam over 20-30 cm of very firm clay loam to silty clay loam over compact, strongly to slightly acidic, dark grayish brown, silty clay loam to clay loam glacial till. The till is derived from soft gray Carboniferous shale of the Coal Measures and contains small fragments of coal and carbonaceous shale.

Joggins soils are nonstony and nonrocky and are found on undulating to rolling till plains on very gentle to moderate slopes (2-15%).

Location and extent

Soils of the Joggins Association are found on the Northumberland Lowlands in an area centred around New Glasgow and Stellarton and extending west to Westville, north to Trenton, and east to Thorburn. Joggins soils cover 2982 ha or 1.1% of the county.

Soil characteristics

Under forest vegetation Joggins soils have 5-10 cm of mor or moder (see Appendix 2, Table 2-8 and Fig. 22). Underlying this surface organic layer is a friable, loam to silty clay loam A horizon, that is leached, mottled, and gleyed. Below the A horizon is a very firm, coarsely structured B horizon, which is characterized by large bright orange mottles and thin clay films on the surfaces of the soil aggregates. This gleyed B horizon ranges in texture from silty clay to clay loam and grades into massive subsoil at a depth of 45-55 cm. The silty clay loam to clay loam subsoil (C horizon) is impermeable to water and may contain up to 15% shaly gravel.

10
0
10
20
30
40
50
60
70
80
90

Fig. 22. Joggins soil profile.

Associated soils

Joggins soils are associated with Queens and Shulie soils. Joggins soils merge with Queens soils near Westville and Stellarton. At these locations, Joggins soils have dark reddish brown colored subsoil similar to the Queens soils. Near Thorburn, intergrades between Shulie and Joggins soils are found. These soils have been mapped as Joggins soils but are somewhat lighter textured and contain about 20% coarse fragments of very fine sandstone.

Map units

One map unit has been established for the Joggins Association.

Jg4 (16 areas: 2982 ha). Jg4 map units are composed dominantly of imperfectly drained Gleyed Brunisolic Gray Luvisols with significant inclusions of poorly drained Orthic Luvic Gleysols.

On very gentle slopes and on lower slope positions on moderate sloping landscapes, the impermeable subsoil causes perched water tables to saturate the upper soil for extended periods during the growing season. The imperfectly drained soils are usually located on the upper slope positions of moderate slopes and where good surface drainage exists. Jg4 units are nonstony and nonrocky.

KIRKHILL ASSOCIATION (Kh)

Parent material and landform

Kirkhill soils have developed in 60-80 cm of gravelly sandy loam to gravelly loam over weakly compacted, strongly acidic, olive to grayish brown, gravelly sandy loam to very gravelly sandy loam till. The till is shallow and derived principally from hard, dark gray, Horton shales and contains 30-75% shaly coarse fragments.

Kirkhill soils are moderately to very stony and nonrocky to slightly rocky. They are found on rolling and hummocky till veneers and as thin blankets on gentle to strong slopes (6-30%).

Location and extent

Soils of the Kirkhill Association are found on the northwestern edge of the Horton Highlands between the Colchester border and Black Rock at elevations between 120 and 240 m. Kirkhill soils cover 2579 ha or 0.9% of the county.

Soil characteristics

Under mixed wood forest Kirkhill soils have 5-10 cm of poorly decomposed, extremely acidic mor (see Appendix 2, Table 2-9). Underlying this fibrous organic mat is 60-80 cm of friable gravelly loam to very gravelly sandy loam. This layer contains abundant shaly gravel and flagstones and is very porous. On till veneers this friable layer is typically underlain by a very permeable subsoil high in coarse fragments that grades with depth into shattered shale bedrock (Fig. 23).

On till blankets the subsoil is somewhat compacted, has a moderate to slow permeability, and has a lower coarse fragment content than the shallower veneers.

Associated soils

To the south, Kirkhill soils are associated with the Perch Lake soils on the Horton Highlands and to the north, the Millbrook, Woodbourne, Thom, and Hebert soils located on the south edge of the Pictou Basin.

Fig. 23. Kirkhill soils have developed on till veneer that overlie shattered Horton shales.

Map units

Three map units have been established in the Kirkhill Association.

Kh1 (11 areas: 900 ha). Kh1 map units are composed of well drained Orthic Humo-Ferric Podzols on till veneers and upper slope positions that have good surface drainage. These units are moderately to very stony and non to slightly rocky.

Kh2 (7 areas: 1569 ha). Kh2 map units are composed dominantly of well drained Orthic Humo-Ferric Podzols (Kh1 map units) with significant inclusions of imperfectly drained Gleyed Humo-Ferric Podzols (Kh3 map units). The imperfectly drained soils are located on mid to lower slopes that receive seepage and on gentle slopes that have reduced surface drainage. The imperfectly drained soils frequently have moderately to slowly permeable subsoils. Kh2 units are moderately to very stony and non to slightly rocky.

Kh5 (4 areas: 110 ha). Kh5 map units are composed of poorly drained Orthic Gleysols. These units are located in wet depressions that are saturated for extended periods throughout the year. Kh5 units are commonly associated with black spruce - sphagnum forest. Some of the soils in this unit may have peaty surfaces up to 30 cm deep. Kh5 map units are moderately to very stony and nonrocky.

KIRKMOUNT ASSOCIATION (Kt)

Parent material and landform

Kirkmount soils have developed in 60-80 cm of gravelly sandy loam to gravelly loam over compact, strongly acidic, yellowish brown, gravelly sandy loam till. The till is shallow and stony and is derived principally from schist, quartzite, and hard sandstone. The till contains 20-50% angular gravels, cobbles and stones (Fig. 24). Kirkmount soils are very stony and non to slightly rocky, and are found on hummocky and rolling till veneers and thin blankets on very gentle to strong slopes (2-30%).

Location and extent

Soils of the Kirkmount Association are found on the Pictou Highlands and cover a large area that stretches from Middle Barneys River in the east to Brookville in the west. Two areas branch from this central body of Kirkmount soils. One branch stretches south from Brookville to St. Paul and the other branch extends south from Greendale to the East River. Small areas of Kirkmount soils are located in the southeast corner of the Pictou Highlands. Kirkmount soils cover 15 808 ha or 5.7% of the county.

Soil characteristics

Under hardwood or mixed wood forest Kirkmount soils have about 5 cm of mor overlying a thin, humus-rich, loamy Ah horizon (see Appendix 2, Table 2-10). Under conifer forest, these soils have about 10 cm of poorly decomposed, extremely acidic, mor and lack underlying Ah horizons. Beneath either humus type is a 60-80 cm layer of friable gravelly sandy loam which contains up to 45% angular gravels, cobbles and stones of schist, quartzite and hard sandstone. The subsoil is compact but relatively porous due to the high coarse fragment content. Landscape position and depth to impermeable bedrock are the major factors affecting soil drainage.

Associated soils

Kirkmount soils are associated with Barney, Thom, Millbrook, Cobequid, and Wyvern soils on the Pictou Highlands.

Fig. 24. Stony Kirkmount till.

Map units

Four map units have been established in the Kirkmount Association.

Kt1 (22 areas: 4402 ha). Kt1 map units are composed of well drained Orthic Humo-Ferric Podzols. They are located on steep slopes and upper slope positions that have good surface drainage. Kt1 map units are very stony, shallow, and slightly rocky.

Kt2 (12 areas: 9572 ha). Kt2 map units are composed dominantly of well drained Orthic Humo-Ferric Podzols (Kt1 units) with significant inclusions of imperfectly drained Gleyed Humo-Ferric Podzols (Kt3 units). Kt2 map units are found on hummocky terrain where the well drained soils are located on the hills and upper slope positions and the imperfectly drained soils are located on lower slopes and in depressions. Kt2 map units are very stony and slightly rocky.

Kt3 (15 areas: 847 ha). Kt3 map units are composed of imperfectly drained Gleyed Humo-Ferric Podzols. They are located in depressions and on lower slope positions that receive seepage from upslope. Level areas that have restricted surface drainage and are shallow over impervious bedrock, which restricts internal drainage, are also included in this unit. Kt3 units are very stony and nonrocky.

Kt4 (5 areas: 987 ha). Kt4 map units are composed dominantly of imperfectly drained Gleyed Humo-Ferric Podzols (Kt3 units), with significant inclusions of poorly drained Orthic Gleysol, many of which have peaty surfaces. These units are located in depressions that remain saturated for most of the year and are associated with black spruce - sphagnum forest. Kt4 map units are very stony and nonrocky.

MILLBROOK ASSOCIATION (Mi)

Parent material and landform

Millbrook soils have developed in 60-80 cm of gravelly sandy loam to loam over compact, very strongly acidic, dark reddish brown, gravelly loam to gravelly clay loam till. The till contains more than 18% clay and is derived from shale and sandstone. Gravel content in the till ranges from 20 to 35%.

Millbrook soils are slightly to moderately stony and nonrocky. They are found on undulating to rolling till blankets on nearly level to moderate slopes (0.5-15%).

Location and extent

Soils of the Millbrook Association are found scattered across the county. A large area is located on the Pictou Highlands adjacent to Eden Lake and north to Middle Barneys River. Millbrook soils are well distributed on the Horton Highlands with the most significant area located in the western half of the Pictou Basin centered near Millbrook. Millbrook soils cover 28 056 ha or 10.1% of the county.

Soil characteristics

Under mixed wood forest Millbrook soils (see Appendix 2, Table 2-11) have 5-10 cm of extremely acidic, poorly decomposed mor. Underlying this organic layer are 60-80 cm of friable gravelly sandy loam to loam. The underlying gravelly loam to gravelly clay loam subsoil is compact, has slow permeability, and contains more than 18% clay. Perched water tables in Millbrook soils are a common occurrence. On slopes this water flows over the slowly permeable subsoils as seepage. Millbrook soils have good moisture-holding capacity and remain moist throughout the growing season.

Associated soils

With increasing clay content the Thom, Barney, Bryden, and Kirkmount soils all grade into finer textured soils that have been grouped and mapped as units of the Millbrook Association. Near Eden Lake, Millbrook soils are closely associated with Cobequid soils. Millbrook soils are also closely associated with Woodbourne and Westbrook soils.

Map units

Four map units have been established in the Millbrook Association.

Mi2 (23 areas: 8915 ha). Mi2 map units are composed dominantly of imperfectly drained Gleyed Humo-Ferric Podzols (Mi3 units) with significant inclusions of moderately well drained Orthic Humo-Ferric Podzols. The moderately well drained soils are found on upper slopes and hilltops and have good surface drainage and subsoils that are more pervious than those of the other soils in the association. Mi2 units are slightly to moderately stony and nonrocky.

Mi3 (110 areas: 13 705 ha). Mi3 map units are composed of imperfectly drained Gleyed Humo-Ferric Podzols. These soils have slowly permeable subsoils and only moderate surface drainage. Mi3 units are found on upper, middle, and lower slope positions. Seepage is persistent in soils situated on mid to lower slope positions during the wetter periods of the year. These soils are slow to dry and usually remain moist throughout the growing season. Mi3 units are slightly to moderately stony and nonrocky.

Mi4 (11 areas: 4628 ha). Mi4 map units are composed dominantly of imperfectly drained Gleyed Humo-Ferric Podzols (Mi3 units) with significant inclusions of poorly drained Orthic Gleysols (Mi5 units). Mi4 map units are located on lower slopes and in depressions. These areas receive seepage and runoff from the surrounding upland. Mi4 map units are slightly to moderately stony and nonrocky.

Mi5 (24 areas: 808 ha). Mi5 map units are composed of poorly drained Orthic Gleysols and are located in wet depressions. These units are saturated for extended periods throughout the year and are commonly associated with black spruce - sphagnum forest vegetation. Some soils within Mi5 map units may have peaty surfaces up to 30 cm thick. These units are slightly to moderately stony and nonrocky.

PERCH LAKE ASSOCIATION (Ph)

Parent material and landform

Perch Lake soils have developed in 70-90 cm of friable gravelly loam to very gravelly sandy loam over compact, strongly acidic, dark brown, gravelly sandy loam till. The till is shallow and stony and is derived from hard Horton sandstone and arenite. The till contains 30-50% angular gravel, cobbles, and stones (Fig. 25).

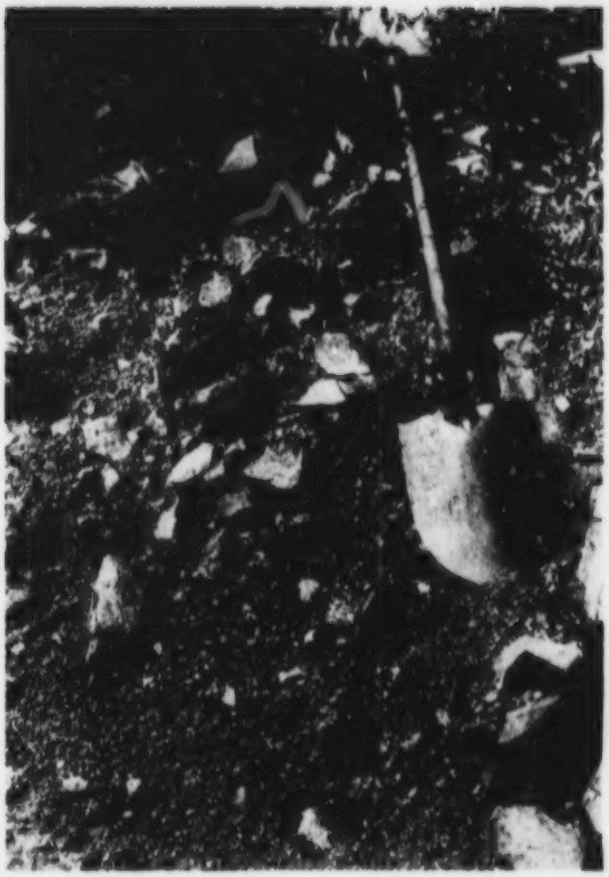


Fig. 25. Perch Lake soils containing many hard, angular cobbles and stones.

Perch Lake soils are very to exceedingly stony and slightly to moderately rocky and are found on rolling to hummocky till veneers and thin blankets on very gentle to moderate slopes (2-15%).

Location and extent

Soils of the Perch Lake Association dominate the Horton Highlands, spanning its full length from east to west. Perch Lake soils cover 20 727 ha or 7.4% of the county.

Soil characteristics

Perch Lake soils (see Appendix 2, Table 2-12) have 5-10 cm of extremely acidic, poorly decomposed mor derived from conifer or mixed forest litter. This organic mat is underlain by 70-90 cm of friable gravelly loam to very gravelly sandy loam containing many angular cobbles and stones.

A compact porous subsoil underlies this friable layer and has moderate to moderately rapid permeability. Perched water tables commonly occur in level to very gently sloping soils that are underlain by impervious bedrock near the surface.

Associated soils

Perch Lake soils are associated with Bryden soils and the Millbrook, Stewiacke and Castley soils located on the Horton Highlands. When Perch Lake soils become finer in texture, deeper and less stony they grade in Bryden soils.

Map units

Five map units have been established in the Perch Lake Association.

Ph1 (20 areas: 4176 ha). Ph1 map units are composed of well drained Orthic Humo-Ferric Podzols. They are located on upper to middle slopes and on gently slopes areas of deeper till that have good internal drainage. Ph1 map units are very to exceedingly stony and slightly to moderately rocky.

Ph2 (17 areas: 10 191 ha). Ph2 map units are composed dominantly of well drained Orthic Humo-Ferric Podzols (Ph1 map units) with significant inclusions of imperfectly drained Gleyed Humo-Ferric Podzols. The imperfectly drained soils are located in areas with restricted surface drainage and on very gentle slopes that receive seepage and are underlain by impervious bedrock near the surface. Ph2 map units are very to exceedingly stony and slightly to moderately rocky.

Ph4 (6 areas: 618 ha). Ph4 map units are composed dominantly of imperfectly drained Gleyed Humo-Ferric Podzols with significant inclusions of poorly drained Orthic Gleysols (Ph5 map units). These units are located in slowly drained depressions and on very gentle slopes that are underlain by impervious bedrock and have restricted surface drainage. Ph4 map units are frequently associated with lakes. Ph4 units are very to exceedingly stony and slightly to moderately rocky.

Ph5 (38 areas: 1241 ha). Ph5 map units are composed of poorly drained Orthic Gleysols and are located in small poorly drained depressions. These units remain saturated for most of the growing season and are commonly associated with black spruce - sphagnum moss forest. Soils that have peaty surfaces up to 30 cm thick commonly occur in Ph5 map units. Ph5 units are very to exceedingly stony and slightly to moderately rocky.

Ph7 (10 areas: 4501 ha). Ph7 map units are composed dominantly of well drained Orthic Humo-Ferric Podzols (Ph1 map units) with significant inclusions of poorly drained Orthic Gleysols (Ph5 units). These units occur on hummocky terrain where the hummocks are well drained and the depressions between the hummocks are poorly drained. Ph7 map units are very to exceedingly stony and slightly to moderately rocky.

PUGWASH ASSOCIATION (Pw)

Parent material and landform

Pugwash soils have developed in 40-60 cm of friable sandy loam to loam over compact, strongly acidic, dark reddish brown, sandy loam to loam till. The till is derived from red and gray Carboniferous sandstone and contains less than 20% gravel by volume. Pugwash soils are non to slightly stony and nonrocky. They are found on undulating to rolling till plains on nearly level to gentle slopes (0.5-9%) (Fig. 26).

Fig. 26. A Pugwash soil landscape.

Location and extent

Soils of the Pugwash Association are found on the Northumberland Lowlands. A large area occupies the northwestern corner of the county and stretches in a band along the coast from Pictou to River John. From River John the area spreads north to West Branch River John. Other significant areas are located along the coast near Merigomish Harbor, on Merigomish Island, and east to Ponds. Smaller areas are located south of Pictou Harbor and between Salt Springs and Four Mile Brook. Pugwash soils cover 32 691 ha or 11.8% of the county.

Soil characteristics

Under conifer or mixed wood forest Pugwash soils (see Appendix 2, Table 2-13 and Fig. 27) have 4-10 cm of extremely acidic, poorly decomposed, mor. This organic mat is underlain by 40-60 cm of friable sandy loam to loam material, which contains less than 20% gravel.

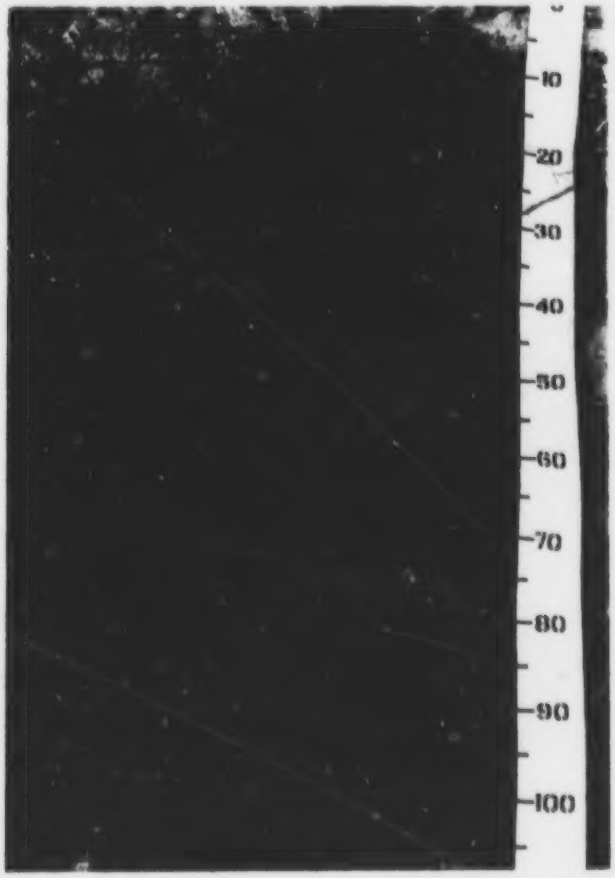


Fig. 27. Pugwash soil profile showing a fracture plane in the fragic subsoil.

A fragipan that commonly occurs below the friable layer and is firm, has weak platy structure, and is slowly to very slowly permeable. The fragipan grades gradually into basal till, which is also very compact and slowly to very slowly permeable. Fracture planes, weakly structured compact subsoil, mottling, and gleying are common characteristics of imperfect and poorly drained Pugwash soils. Textures in the subsoil are sandy loam and loam with clay contents less than 18%.

The slowly pervious subsoils maintain perched water tables in many of these soils, keeping them cold and in a saturated state for varying lengths of time in the spring and early winter. In the spring the warming of the soils is retarded due to their proximity to the Northumberland Strait.

Associated soils

Pugwash soils are associated with Queens, Hansford, Westbrook, Shulie, and Woodbourne soils. Pugwash soils are intermediate in texture between the Queens and Hansford soils. All three soils are closely related, are derived from the same geologic groups, and have the same parent material color. As the clay content in the subsoil increases to more than 18%, Pugwash soils grade into Queens soils. As the gravel content in the subsoil increases above 20% and surface stoniness increases, Pugwash soils grade into Hansford soils.

Map units

Five map units have been established in the Pugwash Association.

Pw2 (21 areas: 4583 ha). Pw2 map units are composed dominantly of moderately well drained Orthic Humo-Ferric Podzols and Fragic Humo-Ferric Podzols with significant inclusions of Gleyed Humo-Ferric Podzols and Gleyed Dystric Brunisols (Pw3 map units). The moderately well drained soils have good surface drainage and subsoils with higher permeabilities than the average. These units are non to slightly stony and nonrocky.

Pw3 (55 areas: 8132 ha). Pw3 map units are composed of imperfectly drained Gleyed Humo-Ferric Podzols, Fragic Humo-Ferric Podzols, and Gleyed Dystric Brunisols. Soils in these units have subsoils that are compact, slowly permeable, and commonly fragic. These units are located on level, mid or lower slopes and have persistent perched water tables, or receive seepage from up slope, or both. Pw3 units are non to slightly stony and nonrocky.

Pw4 (22 areas: 16 802 ha). Pw4 map units are composed dominantly of imperfectly drained Gleyed Humo-Ferric Podzols and Fragic Humo-Ferric Podzols and Gleyed Dystric Brunisols (Pw3 map units) with significant inclusions of poorly drained Orthic Gleysols (Pw5 map units). Soils in Pw4 map units contain soils that have very slowly permeable, compact subsoils, which are commonly fragic. These units are located in very gently undulating terrain and have restricted surface drainage. The poorly drained soils are located in depressions and on lower slopes. Pw4 units are non to slightly stony and nonrocky.

Pw5 (26 areas: 2308 ha). Pw5 map units are composed of poorly drained Orthic Gleysols. Soils in these units have very slowly permeable, compact subsoils, which are usually fragic. Pw5 map units are located in poorly drained depressions that receive seepage and runoff from the surrounding upland and remain saturated for most of the growing season. These map units are non to slightly stony and nonrocky.

Pw6 (16 areas: 866 ha). Pw6 map units are composed dominantly of poorly drained Orthic Gleysols (Pw5 map units) with significant inclusions of very poorly drained organic soils of the Castley Association. These units are located in depressions that receive abundant runoff and seepage and remain saturated throughout the year. Pw6 units are non to slightly stony and nonrocky.

QUEENS ASSOCIATION (Qu)

Parent material and landform

Queens soils have developed in 10-30 cm of silt loam to clay loam over 30-50 cm of firm silt loam to clay loam over compact, strongly acidic to neutral, dark reddish brown, loam to clay loam till. The till is derived from Carboniferous shale and sandstone and contains less than 20% gravel. Queens soils are non to slightly stony and nonrocky and are found on undulating to rolling till plains on nearly level to moderate slopes (0.5-15%).

Location and extent

Soils of the Queens Association are found on the Northumberland Lowlands. The largest distribution of Queens soils is found in the northwestern corner of the county. Large areas are centred around Meadowville and River John. Other significant areas are located around Sylvester and Westville and west of Trenton. Queens soils cover 25 102 ha or 9.1% of the county.

Soils characteristics

Under conifer forest or mixed wood forest Queens soils (see Appendix 2, Table 2-14) have 5-10 cm of extremely acidic, poorly decomposed, mor. This organic forest litter layer is underlain by 10-30 cm of friable silt loam to clay loam. Below this layer is a firm, coarsely structured Bt horizon, which is characterized by thin clay films on the surfaces of the soil aggregates. This slowly permeable Bt horizon is 30-50 cm thick, ranges in texture from silt loam to clay loam, is mottled and gleyed to varying degrees, and grades into the compact, slowly permeable subsoil. The texture of the subsoil ranges from loam and silt loam to sandy clay loam and clay loam and contains more than 18% clay. The coarse fragment content throughout the profile is less than 20% by volume.

Queens soils have slow internal drainage and are at best imperfectly drained. They have perched water tables for extended periods and remain saturated and cold in spring. Because of their proximity to the Northumberland Strait, Queens soils are slow to warm in spring.

Associated soils

Queens soils are associated with Pugwash, Joggins, Westbrook, Woodbourne and Hansford soils. As the clay content in the subsoil decreases to less 18%, Queens soils grade into Pugwash soils. Joggins soils are similar to Queens soils, but they have gray parent material that contains coal fragments and carbonaceous shale.

Map units

Four map units have been established in the Queens Association.

Qu3 (34 areas: 5966 ha). Qu3 map units are composed of imperfectly drained Gleyed Brunisolic Gray Luvisols. These map units are found on mid to upper slopes that have restricted surface drainage, that receive seepage from upslope, or both. Qu3 map units are slow to drain and perched water tables may persist through the spring and early summer and after prolonged rain storms. Qu3 map units are non to slightly stony and nonrocky.

Qu4 (16 areas: 16 187 ha). Qu4 map units are composed dominantly of imperfectly drained Gleyed Brunisolic Gray Luvisols (Qu3 map units) with significant inclusions of poorly drained Orthic Luvic Gleysols (Qu5 map units). Qu4 units are found on very gently undulating to moderately rolling terrain. The imperfectly drained soils are located on mid to upper slopes and the poorly drained soils are found on the lower slopes and in depressions that receive excess runoff and seepage. Qu4 map units are non to slightly stony and nonrocky.

Qu5 (18 areas: 2412 ha). Qu5 map units are composed of poorly drained Orthic Luvic Gleysols and are found in depressions and on lower slopes on nearly level and very gently sloping terrain. Qu5 units typically have poor surface drainage and receive excess seepage and runoff from the surrounding upland. Peaty organic surfaces and black spruce - sphagnum moss forest are commonly associated with this unit. Qu5 map units are non to slightly stony and nonrocky.

Qu6 (5 areas: 537 ha). Qu6 units are composed dominantly of poorly drained Orthic Luvic Gleysols (Qu5 map units) with significant inclusions of very poorly drained organic soils of the Castley Association. These units are located in depressions that receive abundant runoff and seepage and remain saturated throughout the year. Qu6 units are non to slightly stony and nonrocky.

SHULIE ASSOCIATION (Su)

Parent material and landform

Shulie soils have developed in 60-80 cm of gravelly sandy loam over compact, strongly acidic, dark brown, gravelly sandy loam till and is derived from hard gray Carboniferous sandstone. The till is porous and stony and contains 20-40% coarse fragments.

Shulie soils are moderately to very stony and non to slightly rocky and are found on undulating to hummocky, shallow till blankets on very gentle to moderate slopes (2-15%).

Location and extent

Soils of the Shulie Association are found on the Northumberland Lowlands. These soils are not extensive and are found in pockets near Brookland, Boat Harbor and Thorburn. A large hummocky area of Shulie soils is located northeast of Trenton. These soils cover 4243 ha or 1.5% of the county.

Soil characteristics

Under forested vegetation Shulie soils (see Appendix 2, Table 2-15) have about 5 cm of extremely acid, poorly decomposed mor. Underneath this surface organic horizon is a 60-80 cm layer of very friable, gravelly sand loam, which is very porous and contains 20-40% gravel, cobbles, and stones. The subsoil ranges in compaction and is somewhat less porous when compact. Soils that are shallow over bedrock have weakly compacted subsoils. Soils on deeper till deposits commonly have fragipan subsoils that grade into compact basal till. These compact subsoils usually cause restricted internal drainage and are commonly overlain by a shallower friable layer. Shulie soils with strongly compacted subsoils are usually the imperfect and poorly drained members of the association. Shulie soils intergrade with Joggins soils near Thorburn and have higher clay contents, gravelly loam textures, and slower subsoil permeabilities.

Associated soils

Shulie soils are associated with Joggins, Hansford, Pugwash, and Queens soils. Shulie soils are similar to Hansford soils, but they are coarser, shallower to bedrock, and brownish in color. Shulie soils relate more closely in color to Joggins soils, but instead of being derived from gray shale are derived from hard gray sandstone.

Map units

Four map units have been established in the Shulie Association.

Sul (3 areas: 823 ha). Sul map units are composed of well drained Orthic Humo-Ferric Podzols. These units are found on upper slopes with good surface drainage. Soils in these units are moderately to very stony and non to slightly rocky. Soils in Sul map units have porous, weakly compacted subsoils that have a high coarse fragment content.

Su2 (10 areas: 2838 ha). Su2 map units are composed dominantly of well drained Orthic Humo-Ferric Podzols (Su1 map units), with significant inclusions of imperfectly drained Gleyed Humo-Ferric Podzols and Gleyed Eluviated Dystric Brunisols (Su3 map units). Su2 map units are found on hummocky till blankets. The well drained soils are located on upper to mid slopes and the imperfectly drained soils are found on lower slopes and in depressions. These units are moderately to very stony and non to slightly rocky.

Su3 (4 areas: 327 ha). Su3 map units are composed of imperfectly drained Gleyed Humo-Ferric Podzols and Gleyed Eluviated Dystric Brunisols. These units are found on very gentle to gentle slopes with moderate to slow surface drainage. Soils in these units have slowly permeable subsoils and perched water tables in the wetter months of the year. Su3 units are moderately to very stony and nonrocky.

Su5 (6 areas: 255 ha). Su5 map units are composed of poorly drained Orthic Gleysols and are located in depressions that receive abundant runoff and seepage. These map units are saturated for most of the year and are commonly associated with black spruce - sphagnum moss forest. Su5 units are moderately to very stony and nonrocky.

STEWIACKE ASSOCIATION (Se)

Parent material and landform

Stewiacke soils have developed in 60-100 cm of strongly acidic, silt loam to silty clay loam over sandy loam to loamy sand alluvium. These soils are commonly stratified and may contain thin layers of coarser textured alluvium.

Stewiacke soils are located on floodplains adjacent to rivers and streams on level to very gentle slopes (0-5%). Situated in valley bottoms and lowland areas, Stewiacke soils are commonly located in frost pockets which reduces their frost free period. Stewiacke soils are nonstony and nonrocky and are prone to flooding (Fig. 28).

Location and extent

Stewiacke soils are found adjacent to slow-flowing, meandering rivers and streams, principally in areas of low relief with upland soils have high clay and silt content. Stewiacke soils are not extensive. They are found primarily north of the Cobequid Upland on the Northumberland Lowlands where they take on the reddish brown color of surrounding till soils. The most significant area of Stewiacke soils on the Lowlands is adjacent to MacKay Brook near Plainfield. Stewiacke soils are found on many small floodplains associated with the drumlin field north of Trafalgar on the Horton Highlands. These soils are strongly gleyed and gray in color. Soils of the Stewiacke Association cover 2272 ha or 0.8% of the county.

Fig 28. Poorly drained Stewiacke soil landscape near Meadowville.

Soil characteristics

Stewiacke soils like Cumberland soils, are young and show little profile development (see Appendix 2, Table 2-16). Typically they have 60-100 cm of friable to firm silt loam to silty clay loam over friable sandy loam to loam sand.

Under floodplain vegetation, Stewiacke soils have a wide range in the depth and kind of surface organic layers. Soils that are frequently flooded and covered in fresh sediment each year usually have surface litter washed away or buried, and therefore organic surface horizons are absent or very thin. Imperfectly drained Stewiacke soils that are less prone to sedimentation by flooding have thin well to moderately well decomposed mull and moder underlain by Ah mineral horizons rich in humus. Poorly drained soils under sedge vegetation have moderately decomposed peaty Om horizons less than 40 cm thick.

Under forest or shrub vegetation poorly drained Stewiacke soils have moderately decomposed moder organic surface horizons of variable thickness underlain by mineral Ah horizons rich in humus.

The top 60-100 cm layer of silt loam to silty clay loam has moderate to slow permeability and retards the movement of water through the soil. This condition is aggravated by high water tables that persist in Stewiacke soils during the wetter periods. These water tables are fed by seepage and runoff from upland areas which maintain high water levels in the adjacent streams and rivers.

Associated soils

On the Northumberland Lowlands, Stewiacke soils are associated with Queens, Pugwash, Hansford, and Castley soils.

On the Horton Highlands they are associated with Millbrook, Bryden, Perch Lake, and Castley soils.

Map units

Three map units have been established in the Stewiacke Association.

Se4 (3 areas: 500 ha). Se4 map units are composed dominantly of imperfectly drained Gleyed Regosols, Gleyed Cumulic Regosols, and Gleyed Humic Regosols with significant inclusions of poorly drained Rego Gleysols and Rego Humic Gleysols (Se5 map units). Se4 units are nonstony and nonrocky.

Se5 (17 areas: 375 ha). Se5 map units are composed of poorly drained Rego Gleysols and Rego Humic Gleysols. These map units are located in depressions that pond runoff and remain wet for most of the growing season. Se5 map units are nonstony and nonrocky.

Se6 (27 areas: 1397 ha). Se6 map units are composed dominantly of poorly drained Rego Gleysols and Rego Humic Gleysols (Se5 map units) with significant inclusions of very poorly drained organic soils of the Castley Association. These map units are located in very poorly drained depressions and remain saturated for most of the year. Se6 map units are nonstony and nonrocky.

THOM ASSOCIATION (Tm)

Parent material and landform

Thom soils have developed in 60-80 cm of gravelly sandy loam to gravelly silt loam over compact, strongly acidic, dark brown gravelly loam to gravelly sandy loam till. The till is derived from hard, sedimentary and metamorphic rocks, is variable in depth, and frequently quite shallow. The gravel, cobble, and flagstone content of the till ranges from 20 to 55%.

Thom soils are slightly to moderately stony and non to slightly rocky and are found on rolling to hummocky till blankets on nearly level to very strong slopes (0.5-45%).

Location and extent

Soils of the Thom Association are found in two large separate areas. In the west they are located on the upper western side of the Pictou Basin between the Cobequid Upland, the Horton Highlands and the Colchester border. This area is underlain primarily by early Carboniferous bedrock of the Canso Group (see Fig. 5).

The other large area of Thom soils is located in the northeastern quarter of the Pictou Highlands. In this area, the till contains greater amounts of metamorphic rock fragments than in the area to the west and it is underlain by older Silurian and Cambrian bedrock. This area is strongly dissected and contains steeper slopes and rougher terrain than the western area. Thom soils cover 30 636 ha or 11.1% of the county.

Soil characteristics

Under forest vegetation, Thom soils (see Appendix 2, Table 2-17) have 4-10 cm of extremely acidic, poorly decomposed mor. This organic layer is underlain by 60-80 cm of friable gravelly silt loam to gravelly sandy loam. This layer contains 20-45% hard gravels, cobbles, and flagstones. The underlying subsoil is a compact gravelly loam to gravelly sandy loam with moderate to moderately low permeability. Coarse fragments in the subsoil range from 20 to 50% gravels, cobbles, and stones.

Soils on upper slope positions and steep slopes are mostly shallower to bedrock, have greater gravel contents, and are stonier than soils located on mid to lower slope positions and on gently sloping terrain. Soils on mid to lower slopes, that receive seepage and runoff, and soils with poor surface drainage, commonly have perched water tables that persist for extended periods during the wetter months.

Associated soils

As the clay content in the subsoil increases, Thom soils grade into the Millbrook soils. Thom soils are associated with Kirkhill, Castley, and Stewiacke soils, as well as a significant amount of Hebert soils in the Pictou Basin. On the Pictou Highlands, Thom soils are associated with Woodbourne, Barney, Kirkmount, Wyvern, Millbrook, and Hebert soils. Kirkmount soils are stonier and shallower than Thom soils, which contain no schist fragments.

Map units

Four map units have been established in the Thom Association.

Tm1 (52 areas: 10 612 ha). Tm1 map units are composed of well drained Orthic Humo-Ferric Podzols that are frequently shallow and have permeable subsoils. These map units are found on steep slopes and upper slope positions. Tm1 map units are slightly to moderately stony and slightly rocky.

Tm2 (32 areas: 17 860 ha). Tm2 map units are composed dominantly of well drained Orthic Humo-Ferric Podzols (Tm1 map units) with significant inclusions of imperfectly drained Gleyed Humo-Ferric Podzols (Tm3 map units). Tm2 units are located on mid to upper slopes and are slightly to moderately stony and slightly rocky.

Tm3 (24 areas: 1508 ha). Tm3 map units are composed of imperfectly drained Gleyed Humo-Ferric Podzols. These map units are located on mid to lower slopes that receive seepage and runoff and on gentle slopes that have perched water tables causes by slowly permeable subsoils. Tm3 map units are slightly to moderately stony and nonrocky.

Tm5 (14 areas: 656 ha). Tm5 map units are composed of poorly drained Orthic Gleysols. These units are located in depressions that receive seepage from the surrounding upland and remain saturated for extended periods throughout the growing season. Tm5 units are slightly to moderately stony and nonrocky.

WESTBROOK ASSOCIATION (Wb)

Parent material and landform

Westbrook soils have developed in 50-70 cm of gravelly loam to gravelly sandy loam over compact, strongly acidic, red to reddish brown, gravelly loam to very gravelly sandy loam till. The till is shallow and is derived from purplish conglomerate; it contains 20-60% hard rounded gravels.

Westbrook soils are slightly to moderately stony and slightly rocky. They are found on hummocky to rolling till veneers and thin till blankets (Fig. 29), on gentle to very strong slopes (6-45%).

Location and extent

Soils of the Westbrook Association are found principally on the north flank of the Cobequid Upland stretching from the Colchester border east to Campbell Hill and north to Heathbell. Westbrook soils cap the summit and surrounding slopes of Green Hill. Westbrook soils cover 9129 ha or 3.3% of the county.

Soil characteristics

Under forest vegetation, Westbrook soils (see Appendix 2, Table 2-18) have 4-10 cm of poorly decomposed mor overlying 50-70 cm of friable gravelly loam to very gravelly sandy loam. If the soils are shallow over bedrock, the subsoil is usually very porous and weakly compacted, and grades into weathered conglomerate bedrock. Soils that are shallow to bedrock are commonly located on hilltops and on steep upper slopes in deep valleys and eroding ravines. On gentle slopes, the soils are deeper and the subsoil is compact and moderately permeable, and may contain fewer gravels than the shallower soils.

Soils with compact subsoils located on lower slopes and in depressions on gentle slopes commonly have perched water tables during wetter periods. Soils on steep lower slopes and in ravine bottoms frequently receive seepage from upslope and are saturated during wet periods.

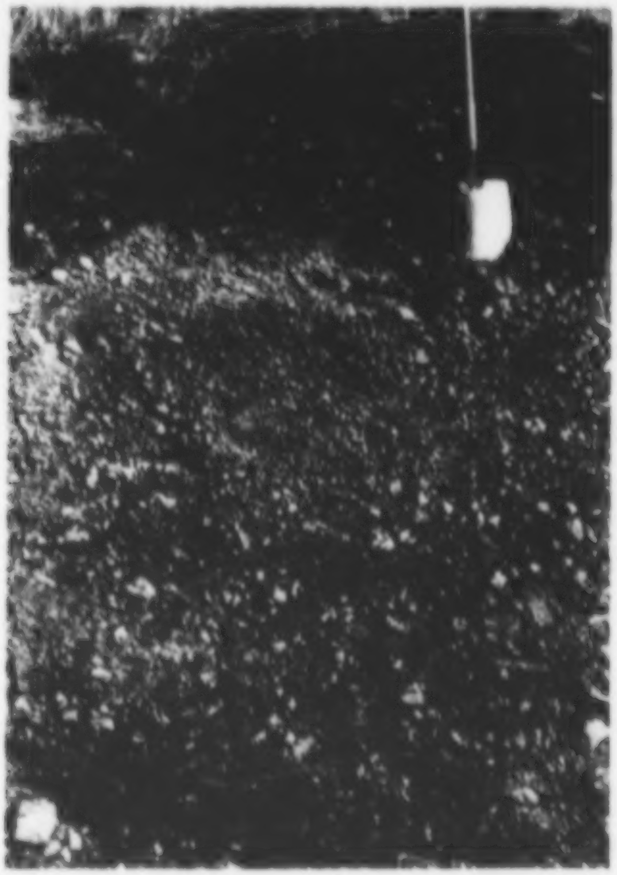


Fig. 29. Westbrook soil developed over conglomerate bedrock.

Associated soils

As the clay content in the subsoil increases, Westbrook soils grade into Millbrook soils. This situation occurs just south of Plainfield and south of Alma. Other soils associated with soils of the Westbrook Association are Cobequid, Queens, Pugwash, Hansford, and Hebert soils.

Map units

Two map units have been established in the Westbrook Association.

Wb1 (14 areas: 2997 ha). Wb1 map units are composed dominantly of well drained Orthic Humo-Ferric Podzols with inclusions of well drained Orthic Dystric Brunisols. These map units are found on shallow, porous, till veneers located on hilltops and on steep, upper slopes. Wb1 map units are slightly to moderately stony and slightly rocky.

Wb2 (15 areas: 6132 ha). Wb2 map units are composed dominantly of well drained Orthic Humo-Ferric Podzols and Orthic Dystric Brunisols (Wb1 map units), with significant inclusions of imperfectly drained Gleyed Humo-Ferric Podzols. The imperfectly drained soils are found in ravine bottoms and on lower slopes and in depressions on gently sloping terrain. Wb2 map units are slightly to moderately stony and slightly rocky.

WOODBOURNE ASSOCIATION (Wo)

Parent material and landform

Woodbourne soils have developed in 50-70 cm of gravelly loam to gravelly sandy loam over compact, very strongly acidic, dark reddish brown, gravelly loam to gravelly clay loam till. The till is derived principally from brown and reddish brown shales and fine grained sandstones of the early Carboniferous Windsor and Canso groups. A purplish tinge characterizes the till, which contains 20-45% gravel.

Woodbourne soils are slightly stony and non rocky and are found on rolling, hilly and hummocky till blankets on very gentle to strong slopes (2-30%) (Fig.30).

Location and extent

Soils of the Woodbourne Association are found predominantly in the East River Valley in Pictou Basin. They range from Plymouth in the north to Lorne in the south and from the western edge of the Pictou Highlands in the east to Westville and Marshdale in the west. This central area of Woodbourne soils is predominantly underlain by bedrock of the Windsor Group. Other significant areas of Woodbourne soils are located on the eastern half of the Northumberland Lowlands between Trenton and Knoydart. These areas are underlain principally by bedrock of the Canso Group. Woodbourne soils cover 10 824 ha or 3.9% of the county.

Soil characteristics

Under forest vegetation, Woodbourne soils (see Appendix 2, Table 2-19) have up to 12 cm of extremely acid, poorly decomposed, mor. Under this organic mat is 50-70 cm of friable gravelly loam to gravelly sandy loam material, which ranges in gravel content from 20 to 45%. Beneath this friable layer is compact, slowly permeable, subsoil material.

This material ranges in texture from gravelly loam to gravelly clay loam and has a clay content of 18% or more and a coarse fragment content of 20-45% by volume. On level to very gentle terrain the subsoil causes perched water tables to persist near the surface during wet periods.

Fig. 30. Hilly Woodbourne soil landscape (in background).

Associated soils

Soils of the Woodbourne Association are associated with Kirkhill, Thom, Barney, Pugwash, Hansford, Queens, Millbrook, and Hopewell soils. Where the subsoil material of Woodbourne soils gets coarser, shallower, and more stony, Woodbourne soils grade into Hopewell soils. Woodbourne soils are similar to Millbrook soils. Woodbourne till has a purplish tinge whereas Millbrook till is more reddish. Woodbourne soils commonly have shallower friable layers overlying compact subsoil and are not as stony as Millbrook soils. Woodbourne soils contain primarily reddish brown shale and fine grain sandstone, whereas Millbrook soils contain a wider mix of rock types.

Map units

Four map units have been established in the Woodbourne Association.

Wo2 (13 areas: 6684 ha). Wo2 map units are composed dominantly of moderately well drained Orthic Humo-Ferric Podzols with significant inclusions of imperfectly drained Gleyed Humo-Ferric Podzols (Wo3 map units). The moderately well drained soils are found on hilltops and upper slopes and have good surface drainage.

The imperfectly drained soils are located on mid to lower slopes that receive seepage from upper slopes and commonly have restricted surface drainage and perched water tables during the wetter months of the year. Wo2 map units are slightly stony and nonrocky.

Wo3 (15 areas: 3184 ha). Wo3 map units are composed of imperfectly drained Gleyed Humo-Ferric Podzols. These maps units are located in depressions and on slopes with restricted surface drainage which commonly receive seepage from upslope. Wo3 map units are slow to dry and usually remain moist throughout the growing season. These map units are slightly stony and nonrocky.

Wo4 (7 areas: 778 ha). Wo4 map units are composed dominantly of imperfectly drained Gleyed Humo-Ferric Podzols (Wo3 map units), with significant inclusions of poorly drained Orthic Gleysols (Wo5 map units). These units are located on very gentle lower slopes and in depressions that receive seepage and runoff from the surrounding uplands. Wo4 map units are slightly stony and nonrocky.

Wo5 (5 areas: 178 ha). Wo5 map units are composed of poorly drained Orthic Gleysols and are located in wet depressions and on lower and gentle slopes with poor surface drainage. These map units are saturated for extended periods throughout the year and are commonly associated with black spruce - sphagnum moss forest. Wo5 units are slightly stony and nonrocky.

WYVERN ASSOCIATION (Wn)

Parent material and landform

Wyvern soils have developed in 60-80 cm of gravelly sandy loam to very gravelly sandy loam over compact, strongly acidic, dark yellowish brown, gravelly sandy loam to very gravelly loamy sand till. The till is shallow, porous, and stony and is derived from granite. Gravel, cobble, and stone content of the till ranges from 30 to 70%.

Wyvern soils are very to excessively stony and slightly to moderately rocky. They are found on rolling to hummocky till veneers and shallow blankets on very gentle to strong slopes (2-30%).

Location and extent

Soils of the Wyvern Association are found in two locations on the Pictou Highlands. One area is southwest of Moose River and the other is between Middle Barneys River and the Antigonish County border. One area of Wyvern soils is located in the Cobequid Upland, between Dalhousie Settlement and the Colchester County border. Wyvern soils cover 11 938 ha or 4.3% of the county.

Soil characteristics

Under forest vegetation Wyvern soils (see Appendix 2, Table 2-20) have 5-12 cm of extremely acidic, poorly decomposed, mor. Underlying this surface organic layer is 60-80 cm of friable gravelly to very gravelly sandy loam material that contains 20-70% gravels, cobbles, and stones. This friable material is underlain by granite bedrock or compacted till subsoils of variable depth over granite bedrock. The compact subsoil is moderately rapid to rapidly permeable because of it's high content of sand and coarse fragments. During wetter periods, persistent perched water tables occur in imperfect and poorly drained soils that are shallow to bedrock and located on gently sloping topography. Seepage water runs downslope over the surface of the bedrock, keeping lower slopes moist and collecting in depressions. These depressions are kept wet throughout the year and are commonly associated with black spruce - sphagnum moss forest vegetation.

Associated soils

Soils of the Wyvern Association are commonly associated with Thom, Cobequid, and Kirkmount soils. Cobequid soils are similar to Wyvern soils but are not as coarse textured or as stony, and they contain a mix of metamorphic and volcanic rocks, of which only a small percentage might be granite.

Map units

Five map units have been established in the Wyvern Association.

Wn1 (15 areas: 3436 ha). Wn1 map units are composed of rapidly to well drained Orthic Humo-Ferric Podzols. These units are found on hilltops, upper slopes and steep slopes that do not have persistent seepage. Wn1 map units are very to excessively stony and slightly to moderately rocky.

Wn2 (15 areas: 6536 ha). Wn2 map units are composed dominantly of rapidly to well drained Orthic Humo-Ferric Podzols (Wn1 map units), with significant inclusions of imperfectly drained Gleyed Humo-Ferric Podzols (Wn3 map units). These units are located on gently sloping hummocky terrain where the rapidly to well drained soils are found on the hummocks and the imperfectly drained soils are located in the depressions between the hummocks. Wn2 map units are also located in steep ravines where the rapidly to well drained soils are located on the upper slopes and the imperfectly drained soils occupy the ravine bottoms. These map units are very to excessively stony and slightly to moderately rocky.

Wn3 (7 areas: 423 ha). Wn3 map units are composed of imperfectly drained Gleyed Humo-Ferric Podzols and are located in depressions and on lower slopes that are kept saturated during the wetter periods of the year by seepage. These map units are very to excessively stony and slightly rocky.

Wn4 (1 areas: 708 ha). Wn4 map units are composed dominantly of imperfectly drained Gleyed Humo-Ferric Podzols (Wn3 map units), with significant inclusions of poorly drained Orthic Gleysols (Wn5 map units). These units are located in depressions and on very gently sloping terrain, and are associated with small meandering streams. The poorly drained components occupy the depressions and remain saturated for most of the year. The poorly drained soils commonly have peaty surfaces less than 40 cm thick and frequently grade into fen peatlands adjacent to the stream. These units are very to excessively stony and slightly rocky.

Wn5 (11 areas: 835 ha). Wn5 map units are composed of poorly drained Orthic Gleysols located in very gently sloping depressions that are saturated for most of the year. Soils in these units commonly have peat surfaces less than 40 cm thick. Wn5 map units are very to excessively stony and slightly rocky.

MISCELLANEOUS LAND TYPES

Coastal beach (Cb)

A few areas of coastal beach have been mapped on Caribou Island, Roy Island, Doctors Island, and Merigomish Island and near the mouth of Pictou Harbor. They are gravel and sand spits formed mainly during storms by the action of waves and longshore drift. The spits connecting Roy Island and Merigomish Island to the mainland are particularly good examples.

Salt-tolerant vegetation has sparsely colonized a few small areas, but most of the areas are devoid of vegetation. Coastal beaches are rapidly drained, non to slightly stony and nonrocky. Coastal beach map units cover 237 ha.

Mine tailings (MT)

Two mine tailing dumps have been mapped, the smaller one is 1.5 km east of Westville and the larger one is just outside Stellarton. Mine tailing dumps consist of large mounds of rock waste from the coal mining operations in the area. These deposits are rapidly drained, excessively stony, and non rocky. Mine tailing map units cover 80 ha.

Salt marsh (SM)

Salt marshes consist of gray silty clay loam marine sediments distributed in spots along the coastline of the Northumberland Strait. These marine sediments are deposited, reworked, and flooded by tidal waters. Salt marshes are stone free and are partially stabilized by salt-tolerant plants such as sand spurry, glasswort, sea-blite, sea-rocket, and salt grass (Fig. 31).

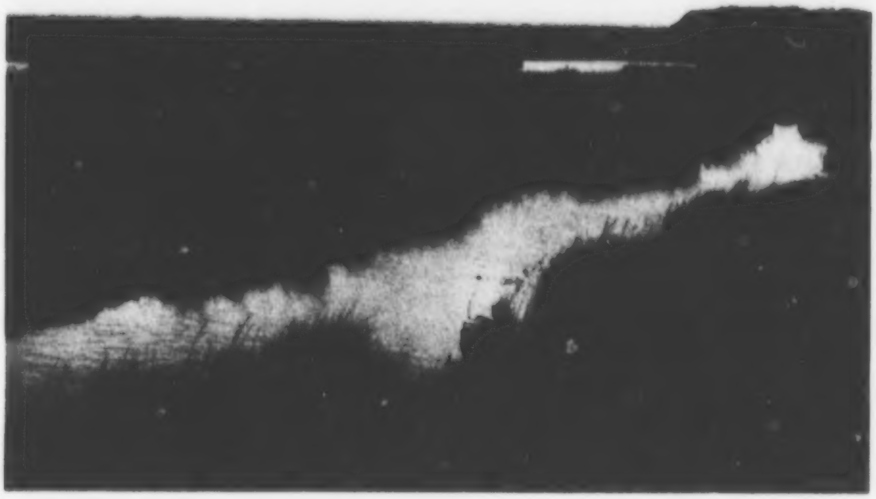


Fig. 31. Salt marsh landscape at Caribou Island.

The deposits are saline and mostly alkaline in reaction, but compacted peat and dense old sediments rich in organic matter are extremely acid where sea water has been unable to penetrate. The peat bodies and acid sediments were laid down during periods of low sea level (Nowland and MacDougall 1973).

Salt marshes are very poorly drained and are nonstony and nonrocky. Salt march map units cover 266 ha.

PART 4. SOIL INTERPRETATIONS FOR VARIOUS USES

This section presents interpretations of soils by map units for use in agriculture, community development, forestry, and as a source of construction material.

Most of the interpretations included here categorize, into a tabular format, soil characteristics that are important for specific uses. The soil map units are then rated to show the degree of suitability or potential for the specific use. The ratings reflect the ease or difficulty of overcoming soil conditions for the specific use with present-day technology. Four classes of soil suitability are utilized.

Good (G). Soils are relatively free of problems or the limitation can be easily overcome. The soils have properties that are suitable for the use proposed. Crop yields are high, standard management or installation and design methods are acceptable, and costs of development or maintenance are not higher because of soil conditions.

Fair (F). Limitations exist but they can be overcome with good or special management and careful design. The soils are basically acceptable for the proposed use but have one or more properties that are incompatible with the use intended. Development and maintenance costs are greater than for lands rated as Good.

Poor (P). Limitations are severe enough to make use questionable because of costs of overcoming them or of continuing problems expected with such use. Costs of development and maintenance can be expected to be higher than for soils rated as Good or Fair. The effects on the environment of utilizing these soils for the intended use can be significant. These soils are very difficult to bring into use.

Unsuitable (U). Soils are unsuited to the proposed use because they have one or more properties that are so restrictive that development is impractical. Development or maintenance costs or both are prohibitive. Inputs required to use these soils are too great to justify the efforts under existing conditions. Very significant damage to the environment would probably result if these soils were used for the proposed purpose.

Guideline tables listing the soil and land characteristics or factors used to determine the interpretive ratings are presented for vegetable crops, alfalfa, spring cereals, winter wheat, on-site sewage disposal systems, housing, area-type sanitary landfill, local roads and streets, sewage lagoons, forestry road construction, off-road use of harvesting equipment, and windthrow hazard; and for sources of topsoil, gravel, and roadfill. Definitions for the codes and abbreviations used in the interpretative guideline tables can be found in Appendix 3.

Graphic methods are used to interpret for erosion susceptibility and tree species to plant.

These interpretations are intended as a guide for general planning purposes only and do not eliminate the need for on-site inspections. When using information in this report, allowance must be made for the scale of the map, which prevents areas smaller than approximately 25 ha to be shown. Interpretations of compound map units are reported for both the dominant and significant soil components only if they differ from each other.

These ratings are based only on soil and landscape criteria. The soil rating indicates the degree of suitability if the soil is used without corrective or precautionary measures. Socioeconomic factors are not considered. The size, shape, and location of a soil map unit is not taken into consideration when it is evaluated for a particular use.

The degree of suitability (good, fair, poor, and unsuitable) are determined by the most restrictive rating assigned to any of the listed soil properties. For example, if the degree of suitability is "good" for all but one soil property, and that property has a degree of suitability of "poor," then the overall rating of the soil for that given use is "poor." However, the degree of suitability of the individual soil properties can have a cumulative effect. This applies only to the suitability ratings "fair" and "poor." If the most severe rating of all the soil properties is "fair," but three or more properties are rated as such, then the overall rating for the soil is downgraded to "poor." The same applies to downgrading "poor" to "unsuitable." In these situations the cumulative affect is indicated by the use of "x" as the limitation symbol.

The limitation symbol is located in parentheses in each interpretive guideline table for each soil factor. The symbols are used with each rating in the interpretive rating tables (see Tables 9, 15, 19, and 23) to indicate the specific soil and landscape factor(s) that would limit the performance of a soil for the rated use.

AGRICULTURE

Soil interpretations for agriculture include:

(1) CLI Agriculture capability class; a nationwide classification system developed for the Canada Land Inventory (CLI) (Department of the Environment 1972).
(2) Suitability for vegetables, for alfalfa, for spring cereals, and for winter wheat.

These ratings are best judgments only and are subject to change. The practice of proper management and the maintenance of adequate soil fertility levels is assumed.

CLI soil capability classification

The mineral soils are divided into seven classes according to increasing limitation for agricultural use. Classes 1, 2, and 3 soils are considered capable of sustained production of common field crops, whereas Class 4 soils are considered marginal for this use. Soils in Class 5 are capable of use only for permanent pasture and hay. Class 6 soils are capable of use for wild pasture only, a condition in which perennial forage crops can be maintained without improvement practices. This condition is rarely obtainable in Pictou County, therefore Class 6 has not been used. Class 7 soils are considered incapable of use for arable culture or permanent pasture. Tree fruits, blueberries, cranberries, and ornamental plants are excluded from this interpretation because they are not considered as cultivated or common field crops.

Subclasses are divisions within classes that have the same kind of limitation for agricultural use. Climate, soil, and landscape limitations used in Pictou County are as follows:

(C) adverse regional climate
(M) inadequate soil moisture holding capacity
(D) poor structure and permeability
(T) unfavorable topography
(P) excess surface stoniness
(R) shallowness to bedrock
(I) inundation or flooding hazard
(W) excess soil water excluding inundation
(F) low fertility
(X) cumulative adverse characteristics.

Vegetable crops

Because of the variability in soil requirements of vegetable crops, the rating of soils for such production can only be generalized. Soils with a "good" suitability rating are relatively free of constraints to the production of a wide variety of vegetable crops. On average, vegetable crops require better soil qualities than do general field crops. These interpretive ratings are not applied to organic soils, because, in general, insufficient information on such areas precludes interpretive judgment.

Production for early markets is not used as a rating criteria. However, suitability deals with the soil's capacity to produce vegetable crops on a viable commercial basis. Home gardening is a different matter. Family gardens are relatively small in size, receive more intensive soil management, and most important, are not governed by the "produce or else" profit aspect of business. Although the interpretations for vegetable crops can be used as a guide to locate soil units most suitable for home gardens, relatively suitable plots can usually be found or established within the boundaries of even the poorer grade soils (Wang and Rees 1983).

Table 5 outlines criteria used in rating soils for vegetable crops.

Alfalfa

Alfalfa has potential in the Atlantic region and has some definite advantages over other forages (Atlantic Field Crops Committee 1980). Soil factors play an important part in the survival of this crop, as alfalfa is a deep-rooting plant with high water requirements (Dube 1981). Alfalfa is susceptible to winter kill by frost heaving or by smothering that occurs when the plants are covered by ice sheets for prolonged periods. Alfalfa has a low tolerance to flooding during the growing season and a few consecutive days of inundation can have serious results.

Guidelines for assessing the soil limitations for alfalfa are presented in Table 6.

Spring cereals

The common spring cereal grains, barley, oats, wheat, and rye are generally adapted to climatic conditions existing in the Atlantic Region and higher yields are normally obtained during cool, moist seasons. One key to successful growing of spring grain in the region is early seeding (Atlantic Field Crops Committee 1980). Good drainage greatly facilitates early seeding and is one of the most important soil factors considered in the soil limitation guidelines for spring cereals presented in Table 7.

Winter wheat

Winter wheat offers some advantages over spring-grown cereals. It matures early reducing the losses that may arise from unfavorable fall weather. Winter wheat usually out yields spring wheat and provides a method of erosion control for land normally left unprotected over winter. The planting of winter wheat gives farmers more flexibility in their operations (Sanderson and Walker 1980). Winter wheat requires good surface and internal soil drainage and excess soil moisture is detrimental to its growth (Dube 1981).

Winter wheat, like alfalfa, is subject to winter kill, and plants can be damaged by ice sheets and frost heave. These soil conditions that contribute to these damaging processes have been considered in Table 8, which outlines the guidelines used in determining the soil limitations for winter wheat.

Table 9 presents, for each map unit, the complete soil interpretations for agriculture.

Table 5. Soil suitability for vegetable crops[1]

Soil factors[2] (limitation symbol)	Degree of suitability			
	Good	Fair	Poor	Unsuitable
Depth of friable soil (cm) (d)	>50	20-50	...	<20
Permeability of subsoil (cm/h) (k)	>0.5	0.1-0.5	<0.1	...
Flooding (i)	none	occasional	frequent	very frequent
Stoniness[3] (p)	0-1	2	3	4-5
Rockiness (r)	0	1	...	2-5
Slope (%) (t)	<2	2-5	5-9	>9
Drainage[3,4] (w)	W,MW,R	I	P	VP
Texture (average of friable soil) (m)	L,SL,SiL LS,S	(SCL,CL,SiCL GCL,GSCL GSiCL)[5] GSL,GL,GSiL	VGSL,VGSiL VGL,GS,GLS	VGS,VGLS SiC

Sources: Department of the Environment 1972, Wang and Rees 1983, Webb et al. 1989.

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[1] Irrigation is assumed.

[2] Soil factor class codes are defined in Appendix 3.

[3] Day 1983.

[4] Improve by one drainage class where tile drainage is feasible, for all soil conditions except the following: <2% slope; organic soils; <100 cm to bedrock; rockiness classes 2-5; stoniness classes 4-5; and where frequent flooding by rivers, lakes, and streams occurs.

[5] Downgrade one class if drainage is imperfect.

Table 6. Soil suitability for alfalfa

Soil factors[1] (limitation symbol)	Degree of suitability			
	Good	Fair	Poor	Unsuitable
Depth of friable soil (cm) (d)	>50	...	20-50	<20
Flooding (i)	none	...	occasional	frequent, very frequent
Stoniness[2] (p)	0-1	2	3	4-5
Rockiness[2] (r)	0	1	...	2-5
Slope(%) (t)	2-9	<2,9-15	15-30	>30
Drainage[2,3] (w)	W	MW,R	I	P,VP
Texture (average of friable soil) (m)	L,SL,SiL GL,GSL,GSiL	SCL,CL,SiCL GSCL,GCL,GSiCL VGSiL,VGL,VGSL	SiC,LS,S	GLS,VGLS VGS

Sources: Holmstrom 1986, Webb et al. 1989.

[1] Soil factor class codes are defined in Appendix 3.

[2] Day 1983.

[3] Improve by one drainage class where tile drainage is feasible, for all soil conditions except the following: <2% slope; organic soils; <100 cm to bedrock; rockiness classes 2-5; stoniness classes 4-5; and where frequent flooding by rivers, lakes, and streams occurs.

Table 7. Soil suitability for spring cereals

Soil factors[1] (limitation symbol)	Degree of suitability			
	Good	Fair	Poor	Unsuitable
Depth of friable soil (cm) (d)	>50	20-50	...	<20
Flooding (i)	none	occasional	frequent	very frequent
Stoniness[2] (p)	0-1	2	3	4-5
Rockiness[2] (r)	0	1	...	2-5
Slope(%) (t)	<5	5-9	9-15	>15
Drainage[2,3] (w)	W,MW	R,I	P	VP
Texture (average of friable soil) (m)	L,SL,SiL GSL,GL,GSiL	(CL,SiCL SCL,GSCL GSiCL,GCL)[4] LS,S	GLS,GS VGL,VGSL	SiC,VGS VGLS

Sources: Holmstrom 1986, Webb et al. 1989.

[1] Soil factor class codes are defined in Appendix 3.

[2] Day 1983.

[3] Improve by one drainage class where tile drainage is feasible, for all soil conditions except the following: <2% slope; organic soils; <100 cm to bedrock; rockiness classes 2-5; stoniness classes 4-5; and where frequent flooding by rivers, lakes, and streams occurs.

[4] Downgrade one class if drainage is imperfect.

Table 8. Soil suitability for winter wheat

Soil factors[1] (limitation symbol)	Degree of suitability			
	Good	Fair	Poor	Unsuitable
Depth of friable soil (cm) (d)	>50	...	20-50	<20
Flooding (i)	none	occasional	frequent	very frequent
Stoniness[2] (p)	0-1	2	3	4-5
Rockiness[2] (r)	0	1	...	2-5
Slope(%) (t)	2-5	<2,5-9	9-15	>15
Drainage[2,3] (w)	W,MW,R	I	P	VP
Texture (average of friable soil) (m)	L,SiL,SL GL,GSL GSiL	LS,S	CL,SiCL,SCL GSCL,GCL,GS GSiCL,GLS VGSL,VGL,VGSiL	VGS,VGLS SiC

Source: Holmstrom 1986, Webb et al. 1989.

[1] Soil factor class codes are defined in Appendix 3.

[2] Day 1983.

[3] Improve by one drainage class where tile drainage is feasible, for all soil conditions except the following: <2% slope; organic soils; <100 cm to bedrock; rockiness classes 2-5; stoniness classes 4-5; and where frequent flooding by rivers, lakes, and streams occurs.

Table 9. SOIL INTERPRETATIONS FOR AGRICULTURE

Map symbol	Agriculture capability	Vegetable crops	Alfalfa	Spring cereals	Winter wheat
By1/C	3R	Px	Fpr	Fpr	Fpr
By1/D	3RT	Pt	Fpr	Px	Px
By1/E	4T	Ut	Px	Pt	Pt
By1/F	5T	Ut	Pt	Ut	Ut
By1/G	7T	Ut	Ut	Ut	Ut
By2/C	2C	Px	Fpr>Fpw	Fpr>Fp	Fpr>Fp
By2/D	3T	Pt	Fpr>Fpw	Px>Fpt	Px>Fpt
By2/E	4T	Ut	Px	Pt	Pt
By2/F	5T	Ut	Pt	Ut	Ut
By3/C	2C	Px	Fpw	Fp	Fp
By3/D	3T	Pt	Fpw	Fpt	Fpt
By3/E	4T	Ut	Px	Pt	Pt
By3/F	5T	Ut	Pt	Ut	Ut
Br1/C	4P	Pp	Pp	Pp	Pp
Br1/D	4P	Ppt	Pp	Pp	Pp
Br2/C	4P>3P	Pp>Px	Pp>Fpw	Pp>Fp	Pp>Fp
Br2/D	4P>3PT	Ppt>Pt	Pp>Fpw	Pp>Fpt	Pp>Fpt
Br2/E	4PT>4T	Ut	Fp>Px	Ppt>Pt	Ppt>Pt
Br2/F	5T	Ut	Ppt>Pt	Ut	Ut
Br3/B	3PW	Px	Pw	Fpw	Px
Br3/C	3P	Px	Fpw	Fp	Fp
Br3/E	4T	Ut	Px	Pt	Pt
Br3/F	5T	Ut	Pt	Ut	Ut
Br4/C	3P>3PW	Px	Fpw>Pw	Fp>Fpw	Fp>Fpw
Br4/D	3PT>4X	Pt	Fpw>Pw	Fpt>Px	Fpt>Px
Ct/A	*NR	Uiw	Uiw	Uiw	Uiw
Ct/B	NR	Uiw	Uiw	Uiw	Uiw
Cd1/C	4PR	Pp	Pp	Ur	Ur
Cd1/D	4PR	Ppt	Pp	Ur	Ur
Cd1/E	5X	Ut	Pp	Ur	Ur
Cd1/F	5T	Ut	Ppt	Urt	Urt
Cd2/C	4PR>4P	Pp	Pp	Ur>Pp	Ur>Pp
Cd2/D	4PR>4P	Ppt	Pp	Ur>Pp	Ur>Pp
Cd2/E	5X>4PT	Ut	Pp	Ur>Ppt	Ur>Ppt
Cd2/F	5T	Ut	Ppt	Urt>Ut	Urt>Ut
Cd2/G	7T	Ut	Ut	Urt>Ut	Urt>Ut
Cd3/C	4P	Pp	Pp	Pp	Pp
Cd3/E	4PT	Ut	Pp	Ppt	Ppt
Cd4/C	4P	Pp	Pp>Ppw	Pp	Pp
Cd5/C	4P	Pp	Ppw	Pp	Pp
Cb	7X	Ui	Uim	Uim	Uim
Cm3/A	4I	Pi	Ui	Pi	Pi
Cm3/B	4I	Pi	Ui	Pi	Pi
Cm3/C	4I	Pi	Ui	Pi	Pi

(continued)

Table 9. SOIL INTERPRETATIONS FOR AGRICULTURE (continued)

Map symbol	Agriculture capability	Vegetable crops	Alfalfa	Spring cereals	Winter wheat
Cm4/A	4I>5I	Pi>Ui	Ui>Uiw	Pi>Ui	Pi>Ui
Cm4/B	4I>5I	Pi>Ui	Ui>Uiw	Pi>Ui	Pi>Ui
Cm4/C	4I>5I	Pi>Ui	Ui>Uiw	Pi>Ui	Pi>Ui
Cm5/A	5I	Ui	Uiw	Ui	Ui
Cm5/B	5I	Ui	Uiw	Ui	Ui
Cm5/C	5I	Ui	Uiw	Ui	Ui
Hd1/C	3P	Px	Fp	Fp	Fp
Hd1/D	3PT	Pt	Fp	Fpt	Fpt
Hd1/E	4T	Ut	Fpt	Pt	Pt
Hd1/F	5T	Ut	Pt	Ut	Ut
Hd2/B	3P>4X	Px	Fpt>Pd	Fp>Px	Fpt>Pd
Hd2/C	3P>3DP	Px	Fp>Pd	Fp>Fdp	Fp>Pd
Hd2/D	3PT>4X	Pt	Fp>Pd	Fpt>Px	Fpt>Pd
Hd2/E	4T	Ut	Fpt>Pd	Pt	Pt>Pdt
Hd2/G	7T	Ut	Ut	Ut	Ut
Hd3/B	4W	Px	Pd	Px	Pd
Hd3/C	3D	Px	Pd	Fdp	Pd
Hd3/D	3DT	Pt	Pd	Px	Pd
Hd5/B	5W	Pw	Uw	Pw	Pdw
Hd5/C	4W	Px	Pdw	Px	Pd
He1/A	3M	Fm	Ftw	Fw	Ft
He1/B	3M	Fm	Ftw	Fw	Ft
He1/C	3M	Fmt	Fw	Fw	G
He1/D	3MT	Pt	Fw	Ftw	Ft
He1/E	4T	Ut	Ftw	Pt	Pt
He2/B	3M>3W	Fm>Fmw	Ftw>Pw	Fw	Ft>Ftw
He2/C	3M>2C	Fmt	Fw	Fw>G	G
He2/D	3MT>3T	Pt	Fw	Ftw>Ft	Ft
He3/C	2C	Fmt	Fw	G	G
He5/C	3MW	Px	Pw	Fw	Fw
He8/B	3M>4I	Fm>Pi	Ftw>Ui	Fw>Pi	Ft>Pi
He8/C	3M>4I	Fmt>Pi	Fw>Ui	Fw>Pi	G>Pi
He8/F	5T>4I	Ut>Pi	Pt>Ui	Ut>Pi	Ut>Pi
Hp1/C	4P	Pmp	Pp	Pmp	Pmp
Hp1/D	4P	Ux	Pp	Pmp	Pmp
Hp1/E	4PT	Ut	Pp	Ux	Ux
Hp2/C	4P	Pmp	Pp	Pmp	Pmp
Hp2/D	4P	Ux	Pp	Pmp	Pmp
Hp2/E	4PT	Ut	Pp	Ux	Ux
Jg4/C	3D>4W	Pk	Pd>Pdw	Pm	Pdm
Jg4/E	4T>4TW	Ut	Pd>Pdw	Pmt	Ux
Kh1/D	4P	Ppt	Pp	Pp	Pp
Kh1/E	4PT	Ut	Pp	Pp	Ppt
Kh2/D	4P	Ppt	Pp	Pp	Pp

(continued)

Table 9. SOIL INTERPRETATIONS FOR AGRICULTURE (continued)

Map symbol	Agriculture capability	Vegetable crops	Alfalfa	Spring cereals	Winter wheat
Kh2/F	5T	Ut	Ppt	Ut	Ut
Kh5/C	4P	Pp	Ppw	Pp	Pp
Kt1/C	4P	Pp	Pp	Pp	Pp
Kt1/D	4P	Ppt	Pp	Pp	Pp
Kt1/E	4PT	Ut	Pp	Ppt	Ppt
Kt1/F	5T	Ut	Ppt	Ut	Ut
Kt1/H	7T	Ut	Ut	Ut	Ut
Kt2/C	4P	Pp	Pp	Pp	Pp
Kt2/D	4P	Ppt	Pp	Pp	Pp
Kt2/E	4PT	Ut	Pp	Ppt	Ppt
Kt2/F	5T	Ut	Ppt	Ut	Ut
Kt3/B	4P	Pp	Ppw	Pp	Pp
Kt3/C	4P	Pp	Pp	Pp	Pp
Kt4/C	4P	Pp	Pp>Ppw	Pp	Pp
Mi2/C	2C	Px>Fpt	Fpw>Fp	Fp	Fp
Mi2/D	3T	Pt	Fpw>Fp	Fpt	Fpt
Mi2/E	4T	Ut	Px>Fpt	Pt	Pt
Mi2/F	5T	Ut	Pt	Ut	Ut
Mi3/B	3W	Px	Pw	Fpw	Px
Mi3/C	2C	Px	Fpw	Fp	Fp
Mi3/D	3T	Pt	Fpw	Fpt	Fpt
Mi3/E	4T	Ut	Px	Pt	Pt
Mi3/F	5T	Ut	Pt	Ut	Ut
Mi4/B	3W>5W	Px	Pw>Uw	Fpw>Pw	Px>Pw
Mi4/C	2C>3W	Px	Fpw>Pw	Fp>Fpw	Fp>Fpw
Mi4/D	3T>3TW	Pt	Fpw>Pw	Fpt>Px	Fpt>Px
Mi5/C	3W	Px	Pw	Fpw	Fpw
Mi5/D	3TW	Pt	Pw	Px	Px
MT	7X	Upt	Up	Upt	Upt
Ph1/C	5P	Upr	Upr	Upr	Upr
Ph1/D	5P	Upr	Upr	Upr	Upr
Ph1/E	5P	Upr	Upr	Upr	Upr
Ph2/C	5P	Upr	Upr	Upr	Upr
Ph2/D	5P	Upr	Upr	Upr	Upr
Ph2/E	5P	Upr	Upr	Upr	Upr
Ph4/C	5P	Upr	Upr	Upr	Upr
Ph4/D	5P	Upr	Upr	Upr	Upr
Ph5/B	5P	Upr	Upr	Upr	Upr
Ph5/C	5P	Upr	Upr	Upr	Upr
Ph7/C	5P	Upr	Upr	Upr	Upr
Ph7/D	5P	Upr	Upr	Upr	Upr
Pw2/C	2C>3D	Ft>Px	G>Pd	G>Fd	G>Pd
Pw2/D	3T>3DT	Pt	G>Pd	Ft>Fdt	Ft>Pd
Pw2/E	4T	Ut	Ft>Pd	Pt	Pt>Pdt

(continued)

Table 9. SOIL INTERPRETATIONS FOR AGRICULTURE (continued)

Map symbol	Agriculture capability	Vegetable crops	Alfalfa	Spring cereals	Winter wheat
Pw3/C	3D	Px	Pd	Fd	Pd
Pw3/D	3DT	Pt	Pd	Fdt	Pd
Pw3/E	4T	Ut	Pd	Pt	Pdt
Pw4/C	3D>4W	Px	Pd>Pdw	Fd>Fdw	Pd
Pw4/D	3DT>4W	Pt	Pd>Pdw	Fdt>Px	Pd
Pw5/B	5W	Pw	Uw	Pw	Pdw
Pw5/C	4W	Px	Pdw	Fdw	Pd
Pw5/D	4W	Pt	Pdw	Px	Pd
Pw6/B	5W>NR	Pw>Uiw	Uw>Uiw	Pw>Uiw	Pdw>Uiw
Pw6/C	4W>NR	Px>Uiw	Pw>Uiw	Fdw>Uiw	Pd>Uiw
Qu3/C	3D	Px	Pd	Fd	Pd
Qu3/D	3DT	Pt	Pd	Fdt	Pd
Qu3/E	4T	Ut	Pd	Pt	Pdt
Qu4/C	3D>4W	Px	Pd>Pdw	Fd>Px	Pd>Pdm
Qu4/D	3DT>4W	Pt	Pd>Pdw	Fdt>Px	Pd>Pdm
Qu4/E	4T	Ut	Pd>Pdw	Pt>Pmt	Pd>Ux
Qu5/B	5W	Pw	Uw	Pw	Ux
Qu5/C	4W	Px	Pdw	Px	Pdm
Qu6/B	5W>NR	Pw>Uiw	Uw>Uiw	Pw>Uiw	Ux>Uiw
Qu6/C	4W>NR	Px>Uiw	Pdw>Uiw	Pm>Uiw	Pdm>Uiw
SM	7X	Uiw	Uiw	Uiw	Uiw
Su1/D	4P	Ppt	Pp	Pp	Pp
Su1/E	4PT	Ut	Pp	Ppt	Ppt
Su2/C	4P	Pp	Pp	Pp	Pp
Su2/D	4P	Ppt	Pp	Pp	Pp
Su2/E	4PT	Ut	Pp	Ppt	Ppt
Su3/C	4P	Pp	Pp	Pp	Pp
Su3/D	4P	Ppt	Pp	Pp	Pp
Su5/C	4P	Pp	Ppw	Pp	Pp
Se4/C	4I>5I	Pi>Ui	Ui>Uiw	Pi>Ui	Pi>Ui
Se5/A	5I	Ui	Uiw	Ui	Ui
Se5/B	5I	Ui	Uiw	Ui	Ui
Se6/A	5I>NR	Ui>Uiw	Uiw>Uiw	Ui>Uiw	Ui>Uiw
Se6/B	5I>NR	Ui>Uiw	Uiw>Uiw	Ui>Uiw	Ui>Uiw
Tm1/C	3R	Px	Fpr	Fpr	Fpr
Tm1/D	3RT	Pt	Fpr	Px	Px
Tm1/E	4T	Ut	Px	Pt	Pt
Tm1/F	5T	Ut	Pt	Ut	Ut
Tm1/G	7T	Ut	Ut	Ut	Ut
Tm2/C	3R	Px	Fpr>Fpw	Fpr>Fp	Fpr>Fp
Tm2/D	3RT	Pt	Fpr>Fpw	Px>Fpt	Px>Fpt
Tm2/E	4T	Ut	Px	Pt	Pt
Tm2/F	5T	Ut	Pt	Ut	Ut
Tm3/C	2C	Px	Fpw	Fp	Fp

(continued)

Table 9. SOIL INTERPRETATIONS FOR AGRICULTURE (continued)

Map symbol	Agriculture capability	Vegetable crops	Alfalfa	Spring cereals	Winter wheat
Tm3/D	3T	Pt	Fpw	Fpt	Fpt
Tm3/E	4T	Ut	Px	Pt	Pt
Tm5/B	5W	Pw	Uw	Pw	Pw
Tm5/C	3W	Px	Pw	Fpw	Fpw
Tm5/D	3TW	Pt	Pw	Px	Px
Wb1/C	3R	Px	Fpr	Fpr	Fpr
Wb1/D	3RT	Pt	Fpr	Px	Px
Wb1/E	4T	Ut	Px	Pt	Pt
Wb1/F	5T	Ut	Pt	Ut	Ut
Wb1/G	7T	Ut	Ut	Ut	Ut
Wb1/H	7T	Ut	Ut	Ut	Ut
Wb2/D	3RT>4X	Pt	Fpr>Px	Px	Px
Wb2/E	4T	Ut	Px	Pt	Pt
Wb2/F	5T	Ut	Pt	Ut	Ut
Wb2/G	7T	Ut	Ut	Ut	Ut
Wo2/D	3T	Pt	Fp>Fpw	Ft	Ft
Wo2/E	4T	Ut	Fpt>Px	Pt	Pt
Wo2/F	5T	Ut	Pt	Ut	Ut
Wo3/C	2C	Px	G	G	G
Wo3/D	3T	Pt	G	Ft	Ft
Wo3/E	4T	Ut	Ft	Pt	Pt
Wo4/C	2C>3W	Px	Fw>Pw	G>Fw	G>Fw
Wo5/B	5W	Pw	Uw	Pw	Pw
Wo5/C	3W	Px	Pw	Fw	Fw
Wn1/C	5P	Upr	Upr	Upr	Upr
Wn1/D	5P	Upr	Upr	Upr	Upr
Wn1/E	5P	Upt	Upr	Upr	Upr
Wn1/F	5PT	Upt	Upr	Upr	Upr
Wn2/C	5P	Upr>Up	Upr>Up	Upr>Up	Upr>Up
Wn2/D	5P	Upr>Up	Upr>Up	Upr>Up	Upr>Up
Wn2/E	5P	Upt	Upr>Up	Upr>Up	Upr>Up
Wn2/F	5PT	Upt	Upr>Up	Upr>Upt	Upr>Upt
Wn2/G	7T	Upt	Upr>Upt	Upr>Upt	Upr>Upt
Wn3/C	5P	Up	Up	Up	Up
Wn3/D	5P	Up	Up	Up	Up
Wn4/C	5P	Up	Up>Upw	Up	Up
Wn5/B	5P	Up	Upw	Up	Up
Wn5/C	5P	Up	Upw	Up	Up

*NR - not rated

On-site sewage disposal systems

On-site sewage disposal systems distribute effluent from septic tanks, through a subsurface system of perforated pipe, into the soil where it is absorbed. The subsurface pipe is laid in a trench that closely parallels the natural contour of the land. The soil and site characteristics considered for this interpretation are those that affect the absorption of effluent, the potential for contamination of water supplies, and the construction and maintenance of the system.

Properties that affect the absorption ability of soils are the permeability of the soil, soil drainage as it relates to the persistence of seasonally high water tables, depth of bedrock, and susceptibility to flooding. Surface stones and steep slopes interfere with installation. Steep slopes may also cause lateral seepage of the effluent that may surface downslope. Erosion on steep slopes can be damaging to absorption fields, which may require costly maintenance. Some soils are underlain by loose sand and gravel (e.g. Hebert soils), that may not adequately filter the effluent and as a result groundwater may become contaminated.

Table 10 presents the criteria and classes used to make this interpretation.

Housing

The soil suitability ratings for housing are for homes (single-family dwellings) and other structures (buildings of three stories or fewer) with similar foundation requirements. The soils are rated for buildings with and without basements. Basements are considered to be at least 1.5 m deep. Standard construction practices are assumed, such as damp proofing and installation of foundation drains. The emphasis in rating soils for housing is placed on the properties that affect suitability for foundations. Properties influencing the ease or difficulty of excavation and construction are evaluated for both the building and the installation of utility lines. Excluded from soil suitability ratings for housing are soil suitability for septic tanks and access roads, water supply potential, and factors of location desirability. These are general ratings. It is important to note that on-site investigations are necessary for specific placement of buildings and utility lines and for detailed design of foundations. The ratings are based on soil properties that affect soil strength, settlement under a load, and the ease of excavation.

The properties affecting soil strength and settlement are soil wetness (as inferred by soil drainage), flooding, shrink-swell potential, and soil compressibility. All soils in Pictou County, except the Stewiacke soils have low to very low shrink-swell potential. Soil compressibility is inferred from the Unified Soil Classification System (see Appendix 4). Properties influencing the ease of excavation are flooding, soil wetness, slope, depth to bedrock, and surface stoniness.

Table 11 presents the criteria and classes used to make this interpretation.

Area-type sanitary landfill

A sanitary landfill is a waste disposal area and should be operated in such a way as to minimize its offensiveness (i.e., smoke, odor, appearance, and pollution hazard). Soil is used as the covering and sanitizing material. In the area-type sanitary landfill, successive deposits of refuse are covered by layers of soil until successive layers of waste and soil are built up to the ultimate thickness. Then a final cover of soil is placed over the fill. The soil used for covering is either material left over from preparing (stripping) the landfill area or it can be hauled in.

Soil properties that influence trafficability and the risk of pollution are the principle considerations for assessing sanitary landfills. Flooding is a serious problem because of the risk of washouts and stream pollution and the difficulty of moving trucks in and out of flooded areas. If soil permeability is too rapid, or if fractured bedrock is close to the surface, the risk of the leachate from the landfill contaminating the water supply is great. Wet soils with high water tables may also transmit pollutants to the water supply and may hamper the movement of trucks during wet seasons.

Slope is a consideration because of the extra grading required to maintain roads on sloping soils. Furthermore, leachate may flow along the soil surface on sloped soils and cause difficult seepage problems in completed fills.

Table 12 presents the criteria and classes used to make this interpretation.

Local roads and streets

Suitability for local roads and streets refers to the use of the soil for construction and maintenance of local roads and streets that have all-weather surfacing, usually asphalt, and that are subject to automobile traffic all year. The roads and streets consist of a subgrade, usually of underlying local soil material; a subbase of stable material such as gravel or crushed rock; and the actual road surface or pavement usually asphalt, or in some rural areas, gravel with a binder.

Standard construction practices are assumed for drainage and road grading for shedding water. Most of the soil material used in road construction comes from the soil at hand. This guide is less applicable to the requirements for major highways.

The soil properties considered in this interpretation are those that affect the ease of construction and maintenance of the roads and their strength or load-carrying capacity. The properties that affect traffic supporting capacity are soil strength as inferred from the AASHO and Unified classifications, shrink-swell behavior, potential frost action, and soil wetness.

Table 13 presents the criteria and classes used to make this interpretation.

Sewage lagoons

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Each lagoon has a nearly level floor surrounded by cut slopes or embankments of compacted, relatively impervious soil material. Aerobic lagoons generally are designed so that the depth of sewage is 60-150 cm. Relatively impervious soil for the lagoon floor and sides is desirable to minimize seepage and contamination of local ground water (Soil Conservation Service, 1982).

The soil properties and site features considered for this interpretation are those that affect the sewage lagoon's construction, function, and its ability to hold and retain liquid sewage.

Soil permeability is a critical soil property for sewage lagoons. If the soil is too porous it is difficult to maintain a constant water depth required for proper operation, and seepage from the lagoon may contaminate ground water. Flooding that overtops the lagoon will interfere with its proper function and may release untreated sewage to the river system.

Soils that contain large amounts of organic matter are unsuited for sewage lagoon sites. Organic matter promotes an anaerobic rather than aerobic environment, which interferes with the proper functioning of the lagoon.

Water table depth, as inferred by soil drainage, is important if it raises the water level in the lagoon to a point at which it would overflow and cause a pollution hazard. In impermeable soils high water tables pose no problem.

The construction of sewage lagoons is adversely affected by steep slopes, shallow soils, and high volumes of coarse fragments. Table 14 presents the criteria and classes used to make the interpretation.

Table 15 presents, for each map unit, the complete soil interpretations for community development.

Table 10. Soil suitability for on-site sewage disposal systems

Soil factors[1] (limitation symbol)	Degree of suitability			
	Good	Fair	Poor	Unsuitable
Permeability of subsoil[2] (cm/h) (k)	2-12	0.5-2	<0.5 or 12-25	>25
Depth to compact subsoil (cm) (d)	>50	<50[3]	---	---
Flooding (i)	none	occasional	frequent	very frequent
Stoniness[4] (p)	0-2	3	4-5	---
Depth to bedrock (cm) (r)	>150	100-150	50-100	<50
Slope (%) (t)	2-9	<2[5],9-15	15-30	>30
Drainage (w)	W,MW	R,I	P	VP

Sources: Patterson 1990, Reid 1990, Wang and Rees 1983, United States Department of Agriculture 1976, Coen and Holland 1976.

[1] Soil factor class codes are defined in Appendix 3.

[2] Refers to permeability (as determined by the constant head method using core samples) of the subsoil at and below the depth of the tile line.

[3] Poor for slopes <2% or >15%.

[4] Day 1983.

[5] Good for well drained soils with >50 cm of friable soil.

Table 11. Soil suitability for housing

Soil factors[1] (limitation symbol)	Degree of suitability			
	Good	Fair	Poor	Unsuitable
Depth to seasonal high water table (cm) (w)				
- with basement [drainage]	>120 [W,R]	50-120 [MW]	<50 [I,P]	permanently wet soils [VP]
- without basement [drainage]	>50 [R,W,MW]	20-50 [I]	<20 [P]	
Slope(%) (t)	<9	9-15	15-30	>30
Depth to bedrock (cm) (r)				
- with basement	>150	100-150	<150	---
- without basement	>100	50-100	<50	---
Flood hazard (i)	none	none	occasional	frequent
Unified soil group[2] (b)	GW,GP,SW SP,GM,GC SM,SC, CL (PI<15)[3]	CL (PI>15)[3] ML	CH,MH OL,OH	Pt
Potential frost action[4] (h)	low	moderate	high	---
- drainage W,I	GW,GP,SW,SP	GM,GC,SM, CL,SP	ML,MH	
- drainage P	GW,GP	SW,SP,GC, CL	GM,SM,SC, ML,MH	
Stoniness[5,6] (p)	0-2	3	4-5	---
Shrink-swell[7]	All soils in the survey area rank slight.			

Sources: Wang and Rees 1983, United States Department of Agriculture 1976, Coen and Holland 1976.

Notes to Table 11.

[1] Soil factor class codes are defined in Appendix 3.

[2] Estimate of soil's ability to withstand applied loads.

[3] Plasticity index.

[4] United States Department of Agriculture 1976. Proper house construction should include preventive measures to reduce or eliminate frost heaving.

[5] In this area the surface stones are relatively small in size (<50 cm diameter) and thus are easily removed with light equipment when preparing the site. Thus stoniness is a less severe limitation than might be expected.

[6] Day 1983.

[7] Coen and Holland 1976.

Table 12. Soil suitability for area-type sanitary landfill

Soil factors[1] (limitation symbol)	Degree of suitability			
	Good	Fair	Poor	Unsuitable
Permeability of soil[2] (cm/h) (k)	<5	---	5-25	>25
Flooding (i)	none	<1 in 50 yr	1 in 11-50 yr	>1 in 10 yr
Stoniness[3] (p)	0-2	3	4-5	---
Depth to bedrock (cm) (r)	>200	100-200	50-100	<50
Slope(%) (t)	<9	9-15	15-30	>30
Depth to seasonal high water table[4] (cm) (w) [drainage]	>150 [R,W]	100-150 [MW]	50-100 [I,P]	<50 [VP]
Subsoil texture[5] (s)	SL,L,SiL SCL	SiCL,CL SC,LS	SiC,GS	organic

Sources: Wang and Rees 1983, United States Department of Agriculture 1976.

[1] Soil factor class codes are defined in Appendix 3.

[2] Reflects the soil's ability to retard the movement of leachate from landfills, based on constant head hydraulic conductivity tests run on core samples.

[3] Day 1983.

[4] Refers to the true water table, and associated drainage classes are grouped accordingly. Soils that are poorly or imperfectly drained as a result of a perched water table (i.e., very slowly permeable subsoil, permeability less than 0.1 cm/h) can be rated one class higher.

[5] The subsoil texture reflects the ease of excavation and trafficability.

Table 13. Soil suitability for local roads and streets

Soil factors[1] (limitation symbol)	Degree of suitability			
	Good	Fair	Poor	Unsuitable
Depth to seasonal high water table (cm) (w) [drainage]	>100 [W,R]	100-20 [MW,I]	<20 [P,VP]	---
Slope[2] (%) (t)	<5	5-15	15-30	>30
Depth to bedrock (cm) (r)	>100	50-100	<50	---
Stoniness[3] (p)	0-2	3	4-5	---
Flood hazard (i)	none	<1 in 5 yr	1 in 5 yr	yearly
Subgrade[4] (b)				
- AASHO[5]	A1-A3	A4-A5	A6-A7	---
- Unified[6]	GW,GP,SW SP,(GM,GC SM,SC)[8]	CL (PI<15)[7]	ML,CH,MH OL,OH CL (PI>15)	Pt
Shrink-swell[9]	All soils in the survey area rank good.			
Potential frost action[10] (h)	low	moderate	high	
- drainage W,I	GW,GP,SW,SP	GM,GC,SM, CL,SP	ML,MH	
- drainage P	GW,GP	SW,SP,GC, CL	GM,SM,SC, ML,MH	

Sources: Wang and Rees 1983, United States Department of Agriculture 1976, Coen and Holland 1976.

Notes to Table 13.

[1] Soil factor class codes are defined in Appendix 3.

[2] Due to winter conditions, limitation classes for slope have been altered from standards as set in references.

[3] Day 1983.

[4] Rates the general load-carrying capacity and service characteristics of soil as applied to subgrades or roadbeds.

[5] Asphalt Institute 1961.

[6] Unified soil group ratings according to Designation D2487-69.

[7] Plasticity index.

[8] Downgrade limitation to moderate if more than 30% passes No. 200 seive.

[9] Coen and Holland 1976.

[10] United States Department of Agriculture 1976.

Table 14. Soil suitability for sewage lagoons

Soil factors[1] (limitation symbol)	Degree of suitability			
	Good	Fair	Poor	Unsuitable
Flooding[2] (i)	none	---	1 in 50 yr	yearly
Permeability in subsoil (cm/h) (k)	<0.5	0.5-5	5-15	>15
Stoniness[3] (p)	0-2	3	4	5
Depth to bedrock (cm) (r)	>150	100-150	50-100	<50
Slope(%) (t)	<2	2-5	5-9	>9
Organic matter (%) (o)	<2	2-10	10-30	>30
Coarse fragments (% volume)[3] (f)	<20	20-35	35-50	>50
Unified class (b)	GC,SC,CL,CH	GM,ML,SM,MH	GP,GW,SW,SP	OL,OH,Pt
Depth to seasonal high water table[4] (cm) (w) [drainage]	>150 [R]	100-150 [W,MW]	50-100 [I,P]	<50 [VP]

Sources: Mills and Smith 1981, United States Department of Agriculture 1976.

[1] Soil factor class codes are defined in Appendix 3.

[2] Disregard flooding if it is unlikely to enter or damage the lagoon (flood waters have low velocity and depth of <150 cm).

[3] Day 1983.

[4] If lagoon floor has nearly impermeable material (<0.5 cm/h) and is >50 cm thick, disregard water table.

Table 15. SOIL INTERPRETATIONS FOR COMMUNITY DEVELOPMENT

Map symbol	On-site sewage disposal	Housing		Sanitary landfill	Roads and streets	Sewage lagoons
		with basements	without basements			
By1/C	Fr	Px	Fh	Frw	Fhw	Px
By1/D	Fr	Px	Fh	Frw	Px	Pt
By1/E	Frt	Px	Fht	Px	Px	Ut
By1/F	Pt	Pt	Pt	Pt	Pt	Ut
By1/G	Ut	Ut	Ut	Ut	Ut	Ut
By2/C	Fr>Pk	Px>Pw	Fh>Fhw	Frw>Pw	Fhw	Px
By2/D	Fr>Pk	Px>Pw	Fh>Fhw	Frw>Pw	Px	Pt
By2/E	Frt>Pk	Px>Pw	Fht>Px	Px>Pw	Px	Ut
By2/F	Pkt	Pt>Ptw	Pt	Pt>Ptw	Pt	Ut
By3/C	Pk	Pw	Fhw	Pw	Fhw	Px
By3/D	Pk	Pw	Fhw	Pw	Px	Pt
By3/E	Pk	Pw	Px	Pw	Px	Ut
By3/F	Pkt	Ptw	Pt	Ptw	Pt	Ut
Br1/C	Fp	Px	Fhp	Fpw	Px	Px
Br1/D	Fp	Px	Fhp	Fpw	Px	Pt
Br2/C	Fp>Fkw	Px>Pw	Fhp>Fhw	Fpw>Pw	Px	Px>Pw
Br2/D	Fp>Fkw	Px>Pw	Fhp>Fhw	Fpw>Pw	Px	Pt>Ptw
Br2/E	Fpt>Px	Px>Pw	Px	Px>Pw	Px	Ut
Br2/F	Pt	Pt>Ptw	Pt	Pt>Ptw	Pt	Ut
Br3/B	Px	Pw	Fhw	Pw	Px	Pw
Br3/C	Fkw	Pw	Fhw	Pw	Px	Pw
Br3/E	Px	Pw	Px	Pw	Px	Ut
Br3/F	Pt	Ptw	Pt	Ptw	Pt	Ut
Br4/C	Fkw>Pw	Pw	Fhw>Phw	Pw	Px>Phw	Pw
Br4/D	Fkw>Pw	Pw	Fhw>Phw	Pw	Px>Phw	Ptw
Ct/A	Uiw	Ubi	Ubi	Usw	Ubi	Uow
Ct/B	Uiw	Ubi	Ubi	Usw	Ubi	Uow
Cd1/C	Pr	Pr	Fhp	Pr	Px	Pfr
Cd1/D	Pr	Pr	Fhp	Pr	Px	Ux
Cd1/E	Pr	Pr	Px	Pr	Px	Ut
Cd1/F	Prt	Prt	Pt	Prt	Pt	Ut
Cd2/C	Pr>Px	Pr>Pw	Fhp>Px	Pr>Pw	Px	Pfr>Pfw
Cd2/D	Pr>Px	Pr>Pw	Fhp>Px	Pr>Pw	Px	Ux
Cd2/E	Pr>Px	Pr>Pw	Px	Pr>Pw	Px	Ut
Cd2/F	Prt>Pt	Prt>Ptw	Pt	Prt>Ptw	Pt	Ut
Cd2/G	Ut	Ut	Ut	Ut	Ut	Ut
Cd3/C	Px	Pw	Px	Pw	Px	Pfw
Cd3/E	Px	Pw	Px	Pw	Px	Ut
Cd4/C	Px>Pw	Pw>Phw	Px>Phw	Pw	Px>Phw	Pfw
Cd5/C	Pw	Phw	Phw	Pw	Phw	Pfw
Cb	Ui	Ui	Ui	Ui	Ui	Uiw
Cm3/A	Pi	Ui	Ui	Ui	Ui	Ufi
Cm3/B	Pi	Ui	Ui	Ui	Ui	Ufi

(continued)

Table 15. SOIL INTERPRETATIONS FOR COMMUNITY DEVELOPMENT (continued)

Map symbol	On-site sewage disposal	Housing		Sanitary landfill	Roads and streets	Sewage lagoons
		with basements	without basements			
Cm3/C	Pi	Ui	Ui	Ui	Ui	Ufi
Cm4/A	Pi>Ui	Ui	Ui	Ui	Ui	Ufi
Cm4/B	Pi>Ui	Ui	Ui	Ui	Ui	Ufi
Cm4/C	Pi>Ui	Ui	Ui	Ui	Ui	Ufi
Cm5/A	Ui	Ui	Ui	Ui	Ui	Ufi
Cm5/B	Ui	Ui	Ui	Ui	Ui	Ufi
Cm5/C	Ui	Ui	Ui	Ui	Ui	Ufi
Hd1/C	G	Fh	Fh	G	Fbh	Px
Hd1/D	G	Fh	Fh	G	Px	Pt
Hd1/E	Ft	Fht	Fht	Ft	Px	Ut
Hd1/F	Pt	Pt	Pt	Pt	Pt	Ut
Hd2/B	G>Pd	Fh>Pw	Fh>Fhw	G>Pw	Fbh>Px	Px>Pw
Hd2/C	G>Px	Fh>Pw	Fh>Fhw	G>Pw	Fbh>Px	Px>Pw
Hd2/D	G>Px	Fh>Pw	Fh>Fhw	G>Pw	Px	Pt>Ptw
Hd2/E	Ft>Px	Fht>Pw	Fht>Px	Ft>Pw	Px	Ut
Hd2/G	Ut	Ut	Ut	Ut	Ut	Ut
Hd3/B	Pd	Pw	Fhw	Pw	Px	Pw
Hd3/C	Px	Pw	Fhw	Pw	Px	Pw
Hd3/D	Px	Pw	Fhw	Pw	Px	Ptw
Hd5/B	Pdw	Phw	Phw	Pw	Phw	Pw
Hd5/C	Pw	Phw	Phw	Pw	Phw	Pw
He1/A	Pk	G	G	Pks	G	Uf
He1/B	Pk	G	G	Pks	G	Uf
He1/C	Pk	G	G	Pks	G	Uf
He1/D	Pk	G	G	Pks	Ft	Uf
He1/E	Pk	Ft	Ft	Pks	Ft	Uf
He2/B	Pk>Ftw	G>Pw	G>Fw	Pks>Ux	G>Fw	Uf
He2/C	Pk>Fw	G>Pw	G>Fw	Pks>Ux	G>Fw	Uf
He2/D	Pk>Fw	G>Pw	G>Fw	Pks>Ux	Ft>Ftw	Uf
He3/C	Fw	Pw	Fw	Ux	Fw	Uf
He5/C	Pw	Pw	Pw	Ux	Pw	Uf
He8/B	Pk>Pi	G>Ui	G>Ui	Pks>Ui	G>Ui	Uf>Ufi
He8/C	Pk>Pi	G>Ui	G>Ui	Pks>Ui	G>Ui	Uf>Ufi
He8/F	Pkt>Pi	Pt>Ui	Pt>Ui	Ux>Ui	Pt>Ui	Uf>Ufi
Hp1/C	Fpr	Px	Fhp	Fpr	Fhp	Pf
Hp1/D	Fpr	Px	Fhp	Fpr	Px	Pft
Hp1/E	Px	Px	Px	Px	Px	Ut
Hp2/C	Fpr>Px	Px	Fhp>Px	Fpr>Pw	Fhp>Px	Pf>Pfw
Hp2/D	Fpr>Px	Px	Fhp>Px	Fpr>Pw	Px	Pft>Ux
Hp2/E	Px	Px	Px	Px>Pw	Px	Ut
Jg4/C	Pk>Pkw	Phw	Ph>Phw	Fsw	Pbh>Ux	Fbt
Jg4/E	Pk>Ux	Phw	Ph>Phw	Px	Pbh>Ux	Ut
Kh1/D	Fpr	Px	Fhp	Fpr	Px	Pft

(continued)

Table 15. SOIL INTERPRETATIONS FOR COMMUNITY DEVELOPMENT (continued)

Map symbol	On-site sewage disposal	Housing		Sanitary landfill	Roads and streets	Sewage lagoons
		with basements	without basements			
Kh1/E	Px	Px	Px	Px	Px	Ut
Kh2/D	Fpr>Px	Px>Pw	Fhp>Px	Fpr>Pw	Px	Pft>Ux
Kh2/F	Pt	Pt>Ptw	Pt	Pt>Ptw	Pt	Ut
Kh5/C	Pw	Phw	Pw	Pw	Phw	Pfw
Kt1/C	Fpr	Px	Fhp	Fpr	Fhp	Px
Kt1/D	Fpr	Px	Fhp	Fpr	Px	Pt
Kt1/E	Px	Px	Px	Px	Px	Ut
Kt1/F	Pt	Pt	Pt	Pt	Pt	Ut
Kt1/H	Ut	Ut	Ut	Ut	Ut	Ut
Kt2/C	Fpr>Px	Px>Pw	Fhp>Px	Fpr>Pw	Fhp>Px	Px>Pw
Kt2/D	Fpr>Px	Px>Pw	Fhp>Px	Fpr>Pw	Px	Pt>Ptw
Kt2/E	Px	Px>Pw	Px	Px>Pw	Px	Ut
Kt2/F	Pt	Pt>Ptw	Pt	Pt>Ptw	Pt	Ut
Kt3/B	Px	Pw	Px	Pw	Px	Pw
Kt3/C	Px	Pw	Px	Pw	Px	Pw
Kt4/C	Px>Pw	Pw>Phw	Px>Phw	Pw	Px>Pw	Pw
Mi2/C	Pk>Fk	Pw>Fhw	Fhw>Fh	Pw>Fsw	Px	Fft>Px
Mi2/D	Pk>Fk	Pw>Fhw	Fhw>Fh	Pw>Fsw	Px	Pt
Mi2/E	Pk>Fkt	Ptw>Px	Px>Fht	Pw>Px	Px	Ut
Mi2/F	Pkt>Pt	Ptw>Px	Pt	Ptw>Pt	Pt	Ut
Mi3/B	Pk	Pw	Fhw	Pw	Px	Ff
Mi3/C	Pk	Pw	Fhw	Pw	Px	Fft
Mi3/D	Pk	Pw	Fhw	Pw	Px	Pt
Mi3/E	Pk	Pw	Px	Pw	Px	Ut
Mi3/F	Pkt	Ptw	Pt	Ptw	Pt	Ut
Mi4/B	Pk>Pkw	Pw	Fhw>Pw	Pw	Px>Pw	Ff
Mi4/C	Pk>Pkw	Pw	Fhw>Pw	Pw	Px>Pw	Fft
Mi4/D	Pk>Pkw	Pw	Fhw>Pw	Pw	Px>Pw	Pt
Mi5/C	Pkw	Pw	Pw	Pw	Pw	Fft
Mi5/D	Pkw	Pw	Pw	Pw	Pw	Pt
MT	Ukt	*NR	NR	Uk	Pp	Ukp
Ph1/C	Ppr	Ppr	Pp	Ppr	Pp	Ux
Ph1/D	Ppr	Ppr	Pp	Ppr	Pp	Ux
Ph1/E	Ppr	Ppr	Pp	Ppr	Pp	Ut
Ph2/C	Ppr	Ppr>Ux	Pp	Ppr>Ux	Pp	Ux
Ph2/D	Ppr	Ppr>Ux	Pp	Ppr>Ux	Pp	Ux
Ph2/E	Ppr	Ppr>Ux	Pp	Ppr>Ux	Pp	Ut
Ph4/C	Ppr>Ux	Ux	Pp>Php	Ux	Pp>Ux	Ux
Ph4/D	Ppr>Ux	Ux	Pp>Php	Ux	Pp>Ux	Ux
Ph5/B	Ux	Ux	Php	Ux	Ux	Ux
Ph5/C	Ux	Ux	Php	Ux	Ux	Ux
Ph7/C	Ppr>Ux	Ppr>Ux	Pp>Php	Ppr>Ux	Pp>Ux	Ux
Ph7/D	Ppr>Ux	Ppr>Ux	Pp>Php	Ppr>Ux	Pp>Ux	Ux

(continued)

Table 15. SOIL INTERPRETATIONS FOR COMMUNITY DEVELOPMENT (continued)

Map symbol	On-site sewage disposal	Housing with basements	Housing without basements	Sanitary landfill	Roads and streets	Sewage lagoons
Pw2/C	Fk>Pk	Fhw>Pw	Fh>Fhw	Fw	Px	Px>Fbt
Pw2/D	Fk>Pk	Fhw>Pw	Fh>Fhw	Fw	Px	Pt
Pw2/E	Fkt>Pk	Px>Pw	Fht>Px	Ftw	Px	Ut
Pw3/C	Pk	Pw	Fhw	Fw	Px	Fbt
Pw3/D	Pk	Pw	Fhw	Fw	Px	Pt
Pw3/E	Pk	Pw	Px	Ftw	Px	Ut
Pw4/C	Pk>Pkw	Pw>Phw	Fhw>Phw	Fw	Px>Phw	Fbt
Pw4/D	Pk>Pkw	Pw>Phw	Fhw>Phw	Fw	Px>Phw	Pt
Pw5/B	Ux	Phw	Phw	Fw	Phw	Fb
Pw5/C	Pkw	Phw	Phw	Fw	Phw	Fbt
Pw5/D	Pkw	Phw	Phw	Fw	Phw	Pt
Pw6/B	Ux>Uiw	Phw>Ubw	Phw>Ubw	Fw>Usw	Phw>Ubi	Fb>Ubw
Pw6/C	Pkw>Uiw	Phw>Ubw	Phw>Ubw	Fw>Usw	Phw>Ubi	Fbt>Ubw
Qu3/C	Pk	Pw	Fhw	Fsw	Px	Ft
Qu3/D	Pk	Pw	Fhw	Fsw	Px	Pt
Qu3/E	Pk	Pw	Px	Px	Px	Ut
Qu4/C	Pk>Pkw	Pw	Fhw>Pw	Fsw	Px>Pw	Ft
Qu4/D	Pk>Pkw	Pw	Fhw>Pw	Fsw	Px>Pw	Pt
Qu4/E	Pk>Ux	Pw	Px>Pw	Px	Px>Pw	Ut
Qu5/B	Ux	Pw	Pw	Fsw	Pw	G
Qu5/C	Pkw	Pw	Pw	Fsw	Pw	Ft
Qu6/B	Ux>Uiw	Pw>Ubw	Pw>Ubw	Fsw>Usw	Pw>Ubi	G>Ubw
Qu6/C	Pkw>Uiw	Pw>Ubw	Pw>Ubw	Fsw>Usw	Pw>Ubi	Ft>Ubw
SM	Uiw	Uiw	Uiw	Uiw	Ui	Uiw
Su1/D	Fpr	Px	Fhp	Fpr	Px	Pt
Su1/E	Px	Px	Px	Px	Px	Ut
Su2/C	Fpr>Px	Px>Pw	Fhp>Px	Fpr>Pw	Fhp>Px	Px>Pw
Su2/D	Fpr>Px	Px>Pw	Fhp>Px	Fpr>Pw	Px	Pt>Ptw
Su2/E	Px	Px>Pw	Px	Px>Pw	Px	Ut
Su3/C	Px	Pw	Px	Pw	Px	Pw
Su3/D	Px	Pw	Px	Pw	Px	Ptw
Su5/C	Pw	Phw	Phw	Pw	Phw	Pw
Se4/C	Pi>Ui	Ui	Ui	Ui	Ui	Ui
Se5/A	Ui	Ui	Ui	Ui	Ui	Ui
Se5/B	Ui	Ui	Ui	Ui	Ui	Ui
Se6/A	Ui>Uiw	Ui>Ubw	Ui>Ubw	Ui>Usw	Ui>Ubi	Ui>Ubw
Se6/B	Ui>Uiw	Ui>Ubw	Ui>Ubw	Ui>Usw	Ui>Ubi	Ui>Ubw
Tm1/C	Fr	Fhr	Fh	Fr	Fh	Px
Tm1/D	Fr	Fhr	Fh	Fr	Fht	Pt
Tm1/E	Frt	Px	Fht	Frt	Fht	Ut
Tm1/F	Pt	Pt	Pt	Pt	Pt	Ut
Tm1/G	Ut	Ut	Ut	Ut	Ut	Ut
Tm2/C	Fr>Fkw	Fhr>Pw	Fh>Fhw	Fr>Pw	Fh>Fhw	Px>Pw

(continued)

Table 15. SOIL INTERPRETATIONS FOR COMMUNITY DEVELOPMENT (continued)

Map symbol	On-site sewage disposal	Housing		Sanitary landfill	Roads and streets	Sewage lagoons
		with basements	without basements			
Tm2/D	Fr>Fkw	Fhr>Pw	Fh>Fhw	Fr>Pw	Fht>Px	Pt>Ptw
Tm2/E	Frt>Px	Px>Pw	Fht>Px	Frt>Pw	Fht>Px	Ut
Tm2/F	Pt	Pt>Ptw	Px	Pt>Ptw	Pt	Ut
Tm3/C	Fkw	Pw	Fhw	Pw	Fhw	Pw
Tm3/D	Fkw	Pw	Fhw	Pw	Px	Ptw
Tm3/E	Px	Pw	Px	Pw	Px	Ut
Tm5/B	Pw	Pw	Pw	Pw	Phw	Pw
Tm5/C	Pw	Pw	Pw	Pw	Phw	Pw
Tm5/D	Pw	Pw	Pw	Pw	Phw	Ptw
Wb1/C	Fr	Fhr	Fh	Fr	Fh	Pf
Wb1/D	Fr	Fhr	Fh	Fr	Fht	Pft
Wb1/E	Frt	Px	Fht	Frt	Fht	Ut
Wb1/F	Pt	Pt	Pt	Pt	Pt	Ut
Wb1/G	Ut	Ut	Ut	Ut	Ut	Ut
Wb1/H	Ut	Ut	Ut	Ut	Ut	Ut
Wb2/D	Fr>Frw	Fhr>Pw	Fh>Fhw	Fr>Pw	Fht>Px	Pft>Ux
Wb2/E	Frt>Frw	Px>Pw	Fht>Px	Frt>Pw	Fht>Px	Ut
Wb2/F	Pt	Pt>Ptw	Pt	Pt>Ptw	Pt	Ut
Wb2/G	Ut	Ut	Ut	Ut	Ut	Ut
Wo2/D	Fk>Pk	Fhw>Pw	Fh>Fhw	Fsw>Pw	Px	Pt
Wo2/E	Fk>Pk	Px>Pw	Fht>Px	Px>Pw	Px	Ut
Wo2/F	Pt>Pkt	Pt>Ptw	Pt	Pt>Ptw	Pt	Ut
Wo3/C	Pk	Pw	Fhw	Pw	Px	Fft
Wo3/D	Pk	Pw	Fhw	Pw	Px	Pt
Wo3/E	Pk	Pw	Px	Pw	Px	Ut
Wo4/C	Pk>Pkw	Pw	Fhw>Pw	Pw	Px>Pw	Fft
Wo5/B	Pkw	Pw	Pw	Pw	Pw	Ff
Wo5/C	Pkw	Pw	Pw	Pw	Pw	Fft
Wn1/C	Ppr	Ppr	Pp	Ux	Pp	Uf
Wn1/D	Ppr	Ppr	Pp	Ux	Pp	Uf
Wn1/E	Ppr	Ppr	Pp	Ux	Pp	Uft
Wn1/F	Ux	Ux	Ppt	Ux	Ppt	Uft
Wn2/C	Ppr>Pp	Ppr>Ppw	Pp	Ux	Pp	Uf
Wn2/D	Ppr>Pp	Ppr>Ppw	Pp	Ux	Pp	Uf
Wn2/E	Ppr>Pp	Ppr>Ppw	Pp	Ux	Pp	Uf
Wn2/F	Ux>Ppt	Ux	Ppt	Ux	Ppt	Uft
Wn2/G	Ut	Ut	Ut	Ut	Ut	Uft
Wn3/C	Pp	Ppw	Pp	Ux	Pp	Uf
Wn3/D	Pp	Ppw	Pp	Ux	Pp	Uf
Wn4/C	Pp>Ppw	Ppw>Ux	Pp>Ux	Ux	Pp>Ux	Uf
Wn5/B	Ppw	Ux	Ux	Ux	Ux	Uf
Wn5/C	Ppw	Ux	Ux	Ux	Ux	Uf

*NR - not rated

FORESTRY

The interpretations for forest soils are related to woodland management. The degree of suitability: good, fair, or poor are determined for forestry-road construction, off-road use of harvesting equipment, and windthrow hazard. Relative ratings of high, moderate, and low are determined graphically for assessing erosion hazard. Recommended tree species to plant for reforestation are also presented.

Because these interpretations are based on soil survey information collected for various reasons, the soils may be differentiated more than would be necessary for forestry use alone. Many of the mapping units have the same or similar degrees of limitation for various forestry uses and could be grouped into single forest soil management units.

Forestry-road construction

Forestry roads are required to provide access to the work area and their construction is a significant component in all forest management plans.

Structurally, a road consists of two parts; the pavement and the subgrade. The pavement consists of all material placed on the road above the subgrade and for many forestry roads may be absent or consist of a single layer of gravel.

The subgrade consists of soil material that occurs naturally on or near the road right-of-way. In cut sections, the subgrade material is undisturbed, except possibly for some compaction. In fill sections the subgrade material is transported from nearby cuts or borrow pits and is built up and compacted to the desired elevation (McFarlane et al. 1968).

Forestry roads include main roads, secondary roads, branch roads, and access spurs. These roads have different dimensions for their design elements (UBC Forestry Club 1971), but their construction and performance are influenced by the same soil factors.

Soil factors that influence the ease of construction of forestry roads from the adjacent soil material are soil drainage, particle size (as inferred by the Unified classification), slope, depth to bedrock, rockiness, stoniness, and flooding. Soil factors affecting the performance of road systems after construction are particle size, soil drainage, and flooding.

The soil criteria and classes used in this interpretation are presented in Table 16.

Off-road use of harvesting equipment

This rating indicates the degree to which soil and site factors influence the off-road trafficability of equipment used in forestry operations. The ratings indicate the degree of difficulty expected in operating harvesting machinery under various soil conditions and the potential soil damage that might occur during and after its use. Soil damage is caused by compaction, rutting, displacement, and soil erosion, which can contribute to losses in forest productivity.

Soil and site factors that influence off-road trafficability are soil drainage, soil strength (as inferred in the Unified classification), slope, rockiness, and surface stoniness.

It is assumed that rubber-tired skidders and forwarders are used. Table 17 presents the criteria and classes used in this interpretation.

Resistance to windthrow

Windthrow refers to the uprooting of trees by wind. Windthrow kills potentially merchantable stands of timber, and affected areas are particularly susceptible to infestations of insects and wood-rotting fungi that may then spread to healthy stands.

Under ideal conditions in undisturbed forest the root systems of trees are usually adequate to resist windthrow. Hardwood stands or mixed stands are generally more resistant to windthrow than softwood stands. Trees become susceptible to windthrow when harvesting opens up and exposes trees to the wind. For example the occurrence of windthrow increases along the edges of road right-of-ways and clear cuts. Although increased exposure raises the risk of windthrow, the physical conditions of the rooting medium strongly influences a trees ability to anchor itself and resist being uprooted.

The soil characteristics that affect the anchoring ability of tree roots are soil drainage, depth to rooting restrictions, and soil texture in the rooting zone.

Table 18 presents the criteria and classes used to make this interpretation.

Soil erosion hazard

Soil erosion is the detachment and downhill transport of soil particles by running water. Soil losses caused by water erosion are a function of rainfall intensity and duration, vegetation cover, slope gradient and length, and soil characteristics that determine a soil's erodibility.

In making this interpretation only the soil factors and slope gradient of each map unit are considered.

Areas of mineral soil are exposed by extensive site preparation by scarification, by dense road systems, and by intense forest fires which remove the surface organic layers.

Soil factors that influence soil erodibility are texture, organic matter content, soil structure, and permeability.

An estimate of soil erodibility for each soil association was derived from the soil erodibility nomograph in Fig. 32 (Wischmeier et al. 1971). The soil erodibility rating (K factor) and associated map unit slope were then used to determine the erosion hazard from Fig. 33 (Coen and Holland 1976). The erosion hazard for each map unit is presented (see Table 19).

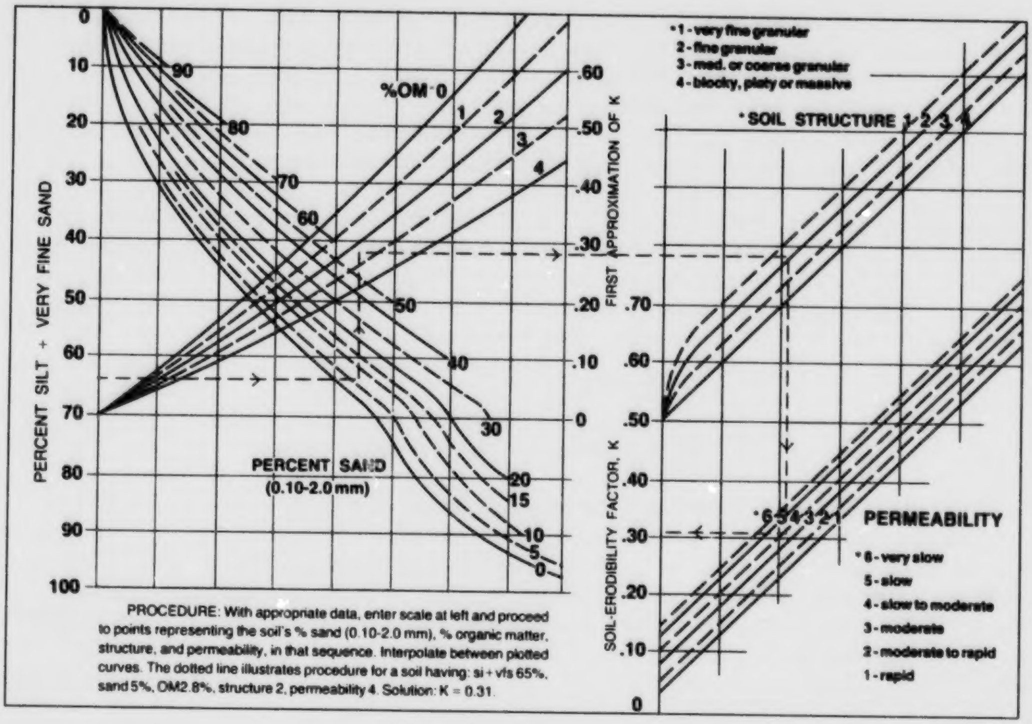
Tree species to plant

The replanting of cutover land with tree seedlings grown in forest nurseries is a widely used method of artificial reforestation. Choosing a suitable tree species to plant is the most important decision in establishing a new stand. The species chosen should be adapted to the climate, soil, and biotic environment of the site. The species selected from those suited to the site should be the ones that promise the best net return (Smith 1962).

This interpretation, made using a modified version of the Nova Scotia Department of Lands and Forests (no date) "Species to plant key" (Fig. 34), assumes that browsing is not a problem and that site preparation is undertaken where ericaceous shrubs pose a threat to successful stand establishment.

Only the top three tree species listed in each box in the "Species to plant key" (see Fig. 34) are recorded in Table 19. Compound map units typically have two sets of tree species listed.

Table 19 presents, for each map unit, the complete soil interpretations for forestry.



PROCEDURE: With appropriate data, enter scale at left and proceed to points representing the soil's % sand (0.10-2.0 mm), % organic matter, structure, and permeability, in that sequence. Interpolate between plotted curves. The dotted line illustrates procedure for a soil having: si + vfs 65%, sand 5%, OM2.8%, structure 2, permeability 4. Solution: K = 0.31.

Fig. 32. Soil-erodibility nomograph (Wischmeier et. al. 1971).

Soils with greater than 20% coarse fragments (CF - 2 mm to 25 cm) are less susceptible to erosion and the band between the dashed lines indicates moderate erosion risk in such cases.

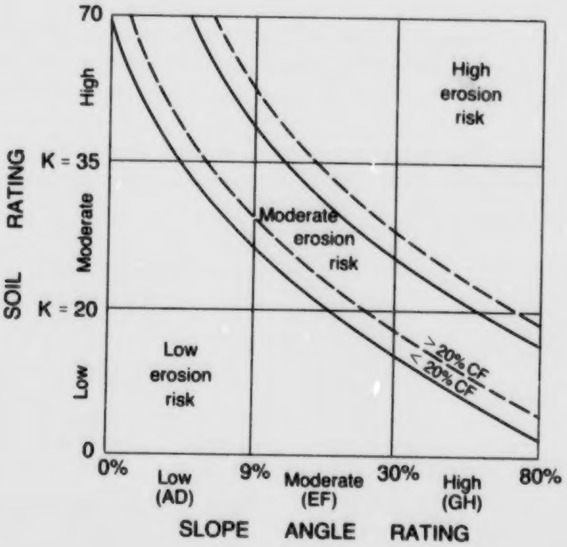


Fig. 33. Erosion hazard of soils (Coen and Holland 1976).

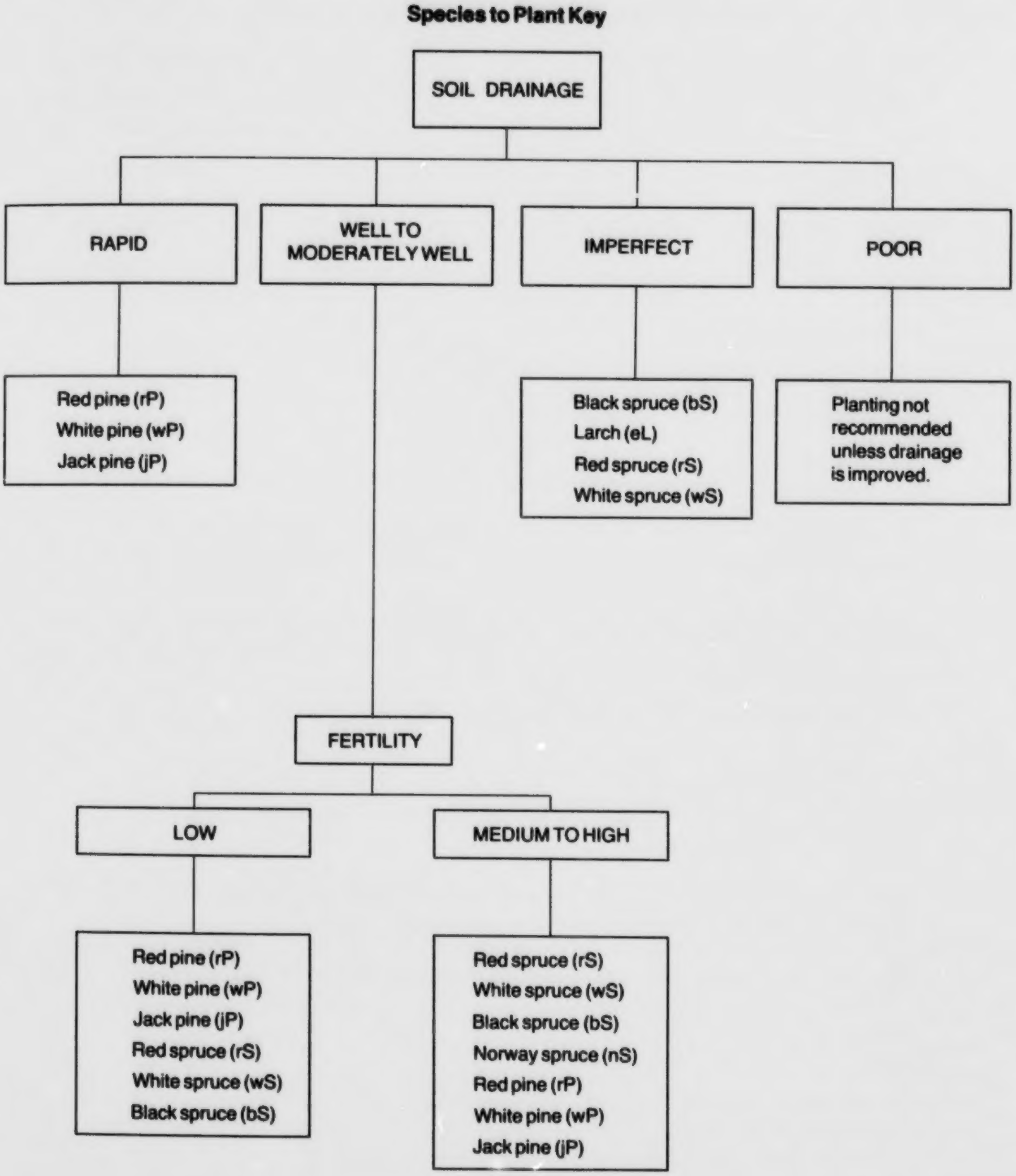

Species to Plant Key
SOIL DRAINAGE
RAPID
WELL TO MODERATELY WELL
IMPERFECT
POOR
Red pine (rP)
White pine (wP)
Jack pine (jP)
Black spruce (bS)
Larch (eL)
Red spruce (rS)
White spruce (wS)
Planting not recommended unless drainage is improved.
FERTILITY
LOW
MEDIUM TO HIGH
Red pine (rP)
White pine (wP)
Jack pine (jP)
Red spruce (rS)
White spruce (wS)
Black spruce (bS)
Red spruce (rS)
White spruce (wS)
Black spruce (bS)
Norway spruce (nS)
Red pine (rP)
White pine (wP)
Jack pine (jP)

Fig. 34. Tree species selection for reforestation (modified from Nova Scotia Department of Lands and Forests - Forestry Field Handbook).

Table 16. Soil suitability for forestry road construction

Soil factors[1] (limitation symbol)	Degree of suitability		
	Good	Fair	Poor
Flooding (i)	1 in 5 yr	1 in 3 yr	yearly
Stoniness[2] (p)	0-3	4	5
Slope (%) (t)	<9	9-30	>30
Rockiness[2] (r)	0-1	2-3	4-5
Subgrade[3] (b)			
- AASHO class	A-1,A-2,A-3	A-4,A-5	A-6,A-7
- Unified class	GW,GP,SW SP,(GM,GC SM,SC)[4]	ML CL(PI<15)	MH,OL,CH OH,Pt CL(PI>15)
Drainage[2] (w)	R,W,MW	I[5]	P,VP

Source: Vold 1981.

[1] Soil factor class codes are defined in Appendix 3.

[2] Day 1983.

[3] See Appendix 4 for description of Unified and AASHO soil classification systems.

[4] Downgrade to fair if >35% passes the No. 200 sieve and if road construction and use are in the spring.

[5] Upgrade one class for gravelly to very gravelly soils.

Table 17. Soil suitability for off-road use of harvesting equipment

Soil factors[1] (limitation symbol)	Degree of suitability		
	Good	Fair	Poor
Drainage[2] (w)	R,W,MW	I	P,VP
Unified class[3] (b)	GW,GP,SW,SP (GM,GC,SM)[4]	SC,ML,CL	MH,CH,OL OH,Pt
Slope[2](%) (t)	<9%	10-30	>30
Rockiness[2] (r)	0,1	2,3	4,5
Stoniness[2] (p)	0-3	4	5

Sources: Vold 1981, Wang and Rees 1983.

[1] Soil factor class codes are defined in Appendix 3.

[2] Day 1983.

[3] See Appendix 4 for description of Unified and AASHO soil classification systems.

[4] Downgrade to fair if >35% passes the No. 200 sieve and if equipment is used in the spring.

Table 18. Soil resistance to windthrow

Soil factors[1] (limitation symbol)	Degree of resistance		
	Good	Fair	Poor
Drainage[2] (w)	R,W,MW	I	P,VP
Rooting depth[3] (cm) (d)	>50	20-50	<20

Source: Vold 1981, Wang and Rees 1983.

[1] Soil factor class codes are defined in Appendix 3.

[2] Day 1983.

[3] Downgrade one class for fine loamy and clayey (>18% clay) particle sizes in the rooting zone.

Table 19. SOIL INTERPRETATIONS FOR FORESTRY

Map symbol	Forestry roads	Off-road use of equipment	Windthrow resistance	Erosion hazard	Species to plant
By1/C	G	G	G	L	rS,wS,bS
By1/D	G	G	G	M	rS,wS,bS
By1/E	Ft	Ft	G	M	rS,wS,bS
By1/F	Ft	Ft	G	H	rS,wS,bS
By1/G	Ut	Pt	G	H	rS,wS,bS
By2/C	G	G>Fw	G>Fw	L	rS,wS,bS>bS,eL,rS
By2/D	G	G>Fw	G>Fw	M	rS,wS,bS>bS,eL,rS
By2/E	Ft	Ft>Ftw	G>Fw	M	rS,wS,bS>bS,eL,rS
By2/F	Ft	Ft>Ftw	G>Fw	H	rS,wS,bS>bS,eL,rS
By3/C	G	Fw	Fw	L	bS,eL,rS
By3/D	G	Fw	Fw	M	bS,eL,rS
By3/E	Ft	Ftw	Fw	M	bS,eL,rS
By3/F	Ft	Ftw	Fw	H	bS,eL,rS
Br1/C	Fb	Fb	G	L	rS,wS,bS
Br1/D	Fb	Fb	G	M	rS,wS,bS
Br2/C	Fb	Fb>Fbw	G>Fw	L	rS,wS,bS>bS,eL,rS
Br2/D	Fb	Fb>Fbw	G>Fw	M	rS,wS,bS>bS,eL,rS
Br2/E	Fbt	Fbt>Px	G>Fw	M	rS,wS,bS>bS,eL,rS
Br2/F	Fbt	Fbt>Px	G>Fw	H	rS,wS,bS>bS,eL,rS
Br3/B	Fb	Fbw	Fw	L	bS,eL,rS
Br3/C	Fb	Fbw	Fw	L	bS,eL,rS
Br3/E	Fbt	Px	Fw	M	bS,eL,rS
Br3/F	Fbt	Px	Fw	H	bS,eL,rS
Br4/C	Fb>Pw	Fbw>Pw	Fw>Pw	L	bS,eL,rS>do not plant
Br4/D	Fb>Pw	Fbw>Pw	Fw>Pw	M	bS,eL,rS>do not plant
Ct/A	Pbw	Pbw	Pw	*NR	do not plant
Ct/B	Pbw	Pbw	Pw	NR	do not plant
Cd1/C	Fr	Fr	G	L	rS,wS,bS
Cd1/D	Fr	Fr	G	L	rS,wS,bS
Cd1/E	Frt	Frt	G	M	rS,wS,bS
Cd1/F	Frt	Frt	G	M	rS,wS,bS
Cd2/C	Fr>G	Fr>Fw	G>Fw	L	rS,wS,bS>bS,eL,rS
Cd2/D	Fr>G	Fr>Fw	G>Fw	L	rS,wS,bS>bS,eL,rS
Cd2/E	Frt>Ft	Frt>Ftw	G>Fw	M	rS,wS,bS>bS,eL,rS
Cd2/F	Frt>Ft	Frt>Ftw	G>Fw	M	rS,wS,bS>bS,eL,rS
Cd2/G	Pt	Pt	G>Fw	H	rS,wS,bS>bS,eL,rS
Cd3/C	G	Fw	Fw	L	bS,eL,rS
Cd3/E	Ft	Ftw	Fw	M	bS,eL,rS
Cd4/C	G>Pw	Fw>Pw	Fw>Pw	L	bS,eL,rS>do not plant
Cd5/C	Pw	Pw	Pw	L	bS,eL,rS>do not plant
Cb	Ui	NR	NR	NR	do not plant
Cm3/A	Pi	Fw	Fw	L	bS,eL,rS
Cm3/B	Pi	Fw	Fw	L	bS,eL,rS
Cm3/C	Pi	Fw	Fw	L	bS,eL,rS

(continued)

Table 19. SOIL INTERPRETATIONS FOR FORESTRY (continued)

Map symbol	Forestry roads	Off-road use of equipment	Windthrow resistance	Erosion hazard	Species to plant
Cm4/A	Pi>Piw	Fw>Pw	Fw>Pw	L	bS,eL,rS>do not plant
Cm4/B	Pi>Piw	Fw>Pw	Fw>Pw	L	bS,eL,rS>do not plant
Cm4/C	Pi>Piw	Fw>Pw	Fw>Pw	L	bS,eL,rS>do not plant
Cm5/A	Piw	Pw	Pw	L	do not plant
Cm5/B	Piw	Pw	Pw	L	do not plant
Cm5/C	Piw	Pw	Pw	L	do not plant
Hd1/C	G	G	G	L	rS,wS,bS
Hd1/D	G	G	G	M	rS,wS,bS
Hd1/E	Ft	Ft	G	M	rS,wS,bS
Hd1/F	Ft	Ft	G	H	rS,wS,bS
Hd2/B	G	G>Fw	G>Fdw	L	rS,wS,bS>bS,eL,rS
Hd2/C	G	G>Fw	G>Fdw	L	rS,wS,bS>bS,eL,rS
Hd2/D	G	G>Fw	G>Fdw	M	rS,wS,bS>bS,eL,rS
Hd2/E	Ft	Ft>Ftw	G>Fdw	M	rS,wS,bS>bS,eL,rS
Hd2/G	Pt	Pt	G>Fdw	H	rS,wS,bS>bS,eL,rS
Hd3/B	G	Fw	Fdw	L	bS,eL,rS
Hd3/C	G	Fw	Fdw	L	bS,eL,rS
Hd3/D	G	Fw	Fdw	M	bS,eL,rS
Hd5/B	Pw	Pw	Pw	L	do not plant
Hd5/C	Pw	Pw	Pw	L	do not plant
He1/A	G	G	G	L	rP,wP,jP
He1/B	G	G	G	L	rP,wP,jP
He1/C	G	G	G	L	rP,wP,jP
He1/D	G	G	G	L	rP,wP,jP
He1/E	Ft	Ft	G	L	rP,wP,jP
He2/B	G	G>Fw	G>Fw	L	rP,wP,jP>bS,eL,rS
He2/C	G	G>Fw	G>Fw	L	rP,wP,jP>bS,eL,rS
He2/D	G	G>Fw	G>Fw	L	rP,wP,jP>bS,eL,rS
He3/C	G	Fw	Fw	L	bS,eL,rS
He5/C	Pw	Pw	Pw	L	do not plant
He8/B	G>Piw	G>Fw	G>Fw	L	rP,wP,jP>bS,eL,rS
He8/C	G>Piw	G>Fw	G>Fw	L	rP,wP,jP>bS,eL,rS
He8/F	Ft>Piw	Ft>Fw	G>Fw	L	rP,wP,jP>bS,eL,rS
Hp1/C	G	G	G	L	rS,wS,bS
Hp1/D	G	G	G	L	rS,wS,bS
Hp1/E	Ft	Ft	G	L	rS,wS,bS
Hp2/C	G	G>Fw	G>Fw	L	rS,wS,bS>bS,eL,rS
Hp2/D	G	G>Fw	G>Fw	L	rS,wS,bS>bS,eL,rS
Hp2/E	Ft	Ft>Ftw	G>Fw	L	rS,wS,bS>bS,eL,rS
Jg4/C	Pbw>Pw	Fbw>Pw	Pd>Pdw	M	bS,eL,rS
Jg4/E	Px>Pw	Px>Pw	Pd>Pdw	H	bS,eL,rS
Kh1/D	G	G	G	L	rS,wS,bS
Kh1/E	Ft	Ft	G	L	rS,wS,bS
Kh2/D	G	G>Fw	G>Fw	L	rS,wS,bS>bS,eL,rS

(continued)

Table 19. SOIL INTERPRETATIONS FOR FORESTRY (continued)

Map symbol	Forestry roads	Off-road use of equipment	Windthrow resistance	Erosion hazard	Species to plant
Kh2/F	Ft	Ft>Ftw	G>Fw	L	rS,wS,bS>bS,eL,rS
Kh5/C	Pw	Pw	Pw	L	do not plant
Kt1/C	G	G	G	L	rS,wS,bS
Kt1/D	G	G	G	M	rS,wS,bS
Kt1/E	Ft	Ft	G	M	rS,wS,bS
Kt1/F	Ft	Ft	G	H	rS,wS,bS
Kt1/H	Pt	Pt	G	H	rS,wS,bS
Kt2/C	G	G>Fw	G>Fw	L	rS,wS,bS>bS,eL,rS
Kt2/D	G	G>Fw	G>Fw	M	rS,wS,bS>bS,eL,rS
Kt2/E	Ft	Ft>Ftw	G>Fw	M	rS,wS,bS>bS,eL,rS
Kt2/F	Ft	Ft>Ftw	G>Fw	H	rS,wS,bS>bS,eL,rS
Kt3/B	G	Fw	Fw	L	bS,eL,rS
Kt3/C	G	Fw	Fw	L	bS,eL,rS
Kt4/C	G>Pw	Fw>Pw	Fw>Pw	L	bS,eL,rS>do not plant
Mi2/C	Fbw>Fb	Fbw>Fb	Fw>G	L	bS,eL,rS>rS,wS,bS
Mi2/D	Fbw>Fb	Fbw>Fb	Fw>G	M	bS,eL,rS>rS,wS,bS
Mi2/E	Px>Fbt	Fbt	Fw>G	M	bS,eL,rS>rS,wS,bS
Mi2/F	Px>Fbt	Fbt	Fw>G	H	bS,eL,rS>rS,wS,bS
Mi3/B	Fbw	Fbw	Fw	L	bS,eL,rS
Mi3/C	Fbw	Fbw	Fw	L	bS,eL,rS
Mi3/D	Fbw	Fbw	Fw	M	bS,eL,rS
Mi3/E	Px	Px	Fw	M	bS,eL,rS
Mi3/F	Px	Px	Fw	H	bS,eL,rS
Mi4/B	Fbw>Pw	Fbw>Pw	Fw>Pw	L	bS,eL,rS>do not plant
Mi4/C	Fbw>Pw	Fbw>Pw	Fw>Pw	L	bS,eL,rS>do not plant
Mi4/D	Fbw>Pw	Fbw>Pw	Fw>Pw	M	bS,eL,rS>do not plant
Mi5/C	Pw	Pw	Pw	L	do not plant
Mi5/D	Pw	Pw	Pw	M	do not plant
MT	NR	NR	NR	NR	NR
Ph1/C	Fpr	Fpr	G	L	rS,wS,bS
Ph1/D	Fpr	Fpr	G	M	rS,wS,bS
Ph1/E	Px	Px	G	M	rS,wS,bS
Ph2/C	Fpr	Fpr>Px	G>Fw	L	rS,wS,bS>bS,eL,rS
Ph2/D	Fpr	Fpr>Px	G>Fw	M	rS,wS,bS>bS,eL,rS
Ph2/E	Px	Px	G>Fw	M	rS,wS,bS>bS,eL,rS
Ph4/C	Fpr>Pw	Px>Pw	Fw>Pw	L	bS,eL,rS>do not plant
Ph4/D	Fpr>Pw	Px>Pw	Fw>Pw	M	bS,eL,rS>do not plant
Ph5/B	Pw	Pw	Pw	L	do not plant
Ph5/C	Pw	Pw	Pw	L	do not plant
Ph7/C	Fpr>Pw	Fpr>Pw	G>Pw	L	rS,wS,bS>do not plant
Ph7/D	Fpr>Pw	Fpr>Pw	G>Pw	M	rS,wS,bS>do not plant
Pw2/C	Fb>Fbw	Fb>Fbw	G>Fdw	M	rS,wS,bS>bS,eL,rS
Pw2/D	Fb>Fbw	Fb>Fbw	G>Fdw	M	rS,wS,bS>bS,eL,rS
Pw2/E	Fbt>Px	Fbt>Px	G>Fdw	H	rS,wS,bS>bS,eL,rS

(continued)

Table 19. SOIL INTERPRETATIONS FOR FORESTRY (continued)

Map symbol	Forestry roads	Off-road use of equipment	Windthrow resistance	Erosion hazard	Species to plant
Pw3/C	Fbw	Fbw	Fdw	M	bS,eL,rS
Pw3/D	Fbw	Fbw	Fdw	M	bS,eL,rS
Pw3/E	Px	Px	Fdw	H	bS,eL,rS
Pw4/C	Fbw>Pw	Fbw>Pw	Fdw>Pw	M	bS,eL,rS>do not plant
Pw4/D	Fbw>Pw	Fbw>Pw	Fdw>Pw	M	bS,eL,rS>do not plant
Pw5/B	Pw	Pw	Pw	L	do not plant
Pw5/C	Pw	Pw	Pw	M	do not plant
Pw5/D	Pw	Pw	Pw	M	do not plant
Pw6/B	Pw>Pbw	Pw>Pbw	Pw	L	do not plant
Pw6/C	Pw>Pbw	Pw>Pbw	Pw	M	do not plant
Qu3/C	Fbw	Fbw	Pd	M	bS,eL,rS
Qu3/D	Fbw	Fbw	Pd	M	bS,eL,rS
Qu3/E	Px	Px	Pd	H	bS,eL,rS
Qu4/C	Fbw>Pw	Fbw>Pw	Pd>Pdw	M	bS,eL,rS>do not plant
Qu4/D	Fbw>Pw	Fbw>Pw	Pd>Pdw	M	bS,eL,rS>do not plant
Qu4/E	Px>Pw	Px>Pw	Pd>Pdw	H	bS,eL,rS>do not plant
Qu5/B	Pw	Pw	Pdw	L	do not plant
Qu5/C	Pw	Pw	Pdw	M	do not plant
Qu6/B	Pw>Pbw	Pw>Pbw	Pdw>Pw	L	do not plant
Qu6/C	Pw>Pbw	Pw>Pbw	Pdw>Pw	M	do not plant
SM	NR	NR	NR	NR	do not plant
Su1/D	G	G	G	L	rS,wS,bS
Su1/E	Ft	Ft	G	M	rS,wS,bS
Su2/C	G	G>Fw	G>Fw	L	rS,wS,bS>bS,eL,rS
Su2/D	G	G>Fw	G>Fw	L	rS,wS,bS>bS,eL,rS
Su2/E	Ft	Ft>Ftw	G>Fw	M	rS,wS,bS>bS,eL,rS
Su3/C	G	Fw	Fw	L	bS,eL,rS
Su3/D	G	Fw	Fw	L	bS,eL,rS
Su5/C	Pw	Pw	Pw	L	do not plant
Se4/C	Pi>Piw	Fbw>Pw	Fw>Pw	M	bS,eL,rS>do not plant
Se5/A	Piw	Pw	Pw	L	do not plant
Se5/B	Piw	Pw	Pw	M	do not plant
Se6/A	Piw>Pbw	Pw>Pbw	Pw	L	do not plant
Se6/B	Piw>Pbw	Pw>Pbw	Pw	M	do not plant
Tm1/C	G	G	G	L	rS,wS,bS
Tm1/D	G	G	G	L	rS,wS,bS
Tm1/E	Ft	Ft	G	M	rS,wS,bS
Tm1/F	Ft	Ft	G	M	rS,wS,bS
Tm1/G	Pt	Pt	G	H	rS,wS,bS
Tm2/C	G	G>Fw	G>Fw	L	rS,wS,bS>bS,eL,rS
Tm2/D	G	G>Fw	G>Fw	L	rS,wS,bS>bS,eL,rS
Tm2/E	Ft	Ft>Ftw	G>Fw	M	rS,wS,bS>bS,eL,rS
Tm2/F	Ft	Ft>Ftw	G>Fw	M	rS,wS,bS>bS,eL,rS
Tm3/C	G	Fw	Fw	L	bS,eL,rS

(continued)

Table 19. SOIL INTERPRETATIONS FOR FORESTRY (continued)

Map symbol	Forestry roads	Off-road use of equipment	Windthrow resistance	Erosion hazard	Species to plant
Tm3/D	G	Fw	Fw	M	bS,eL,rS
Tm3/E	Ft	Ftw	Fw	M	bS,eL,rS
Tm5/B	Pw	Pw	Pw	L	do not plant
Tm5/C	Pw	Pw	Pw	L	do not plant
Tm5/D	Pw	Pw	Pw	L	do not plant
Wb1/C	G	G	G	L	rS,wS,bS
Wb1/D	G	G	G	L	rS,wS,bS
Wb1/E	Ft	Ft	G	M	rS,wS,bS
Wb1/F	Ft	Ft	G	M	rS,wS,bS
Wb1/G	Pt	Pt	G	H	rS,wS,bS
Wb1/H	Pt	Pt	G	H	rS,wS,bS
Wb2/D	G	G>Fw	G>Fw	L	rS,wS,bS>bS,eL,rS
Wb2/E	Ft	Ft>Ftw	G>Fw	M	rS,wS,bS>bS,eL,rS
Wb2/F	Ft	Ft>Ftw	G>Fw	M	rS,wS,bS>bS,eL,rS
Wb2/G	Pt	Pt	G>Fw	H	rS,wS,bS>bS,eL,rS
Wo2/D	G	G>Fw	G>Fw	M	rS,wS,bS>bS,eL,rS
Wo2/E	Ft	Ft>Ftw	G>Fw	M	rS,wS,bS>bS,eL,rS
Wo2/F	Ft	Ft>Ftw	G>Fw	H	rS,wS,bS>bS,eL,rS
Wo3/C	G	Fw	Fw	L	bS,eL,rS
Wo3/D	G	Fw	Fw	M	bS,eL,rS
Wo3/E	Ft	Ftw	Fw	M	bS,eL,rS
Wo4/C	G>Pw	Fw>Pw	Fw>Pw	L	bS,eL,rS>do not plant
Wo5/B	Pw	Pw	Pw	L	do not plant
Wo5/C	Pw	Pw	Pw	L	do not plant
Wn1/C	Fpr	Fpr	G	L	rP,wP,jP
Wn1/D	Fpr	Fpr	G	L	rP,wP,jP
Wn1/E	Px	Px	G	M	rP,wP,jP
Wn1/F	Px	Px	G	M	rP,wP,jP
Wn2/C	Fpr>Fp	Fpr>Fpw	G>Fw	L	rP,wP,jP>bS,eL,rS
Wn2/D	Fpr>Fp	Fpr>Fpw	G>Fw	L	rP,wP,jP>bS,eL,rS
Wn2/E	Px>Fpt	Px	G>Fw	M	rP,wP,jP>bS,eL,rS
Wn2/F	Px>Fpt	Px	G>Fw	M	rP,wP,jP>bS,eL,rS
Wn2/G	Pt	Pt	G>Fw	H	rP,wP,jP>bS,eL,rS
Wn3/C	Fp	Fpw	Fw	L	bS,eL,rS
Wn3/D	Fp	Fpw	Fw	L	bS,eL,rS
Wn4/C	Fp>Pw	Fpw>Pw	Fw>Pw	L	bS,eL,rS>do not plant
Wn5/B	Pw	Pw	Pw	L	do not plant
Wn5/C	Pw	Pw	Pw	L	do not plant

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*NR - not rated

SOIL AS A SOURCE OF MATERIAL

Apart from being used on location, soils are also sources for material. The suitability of the soil as a source of topsoil (for landscaping), gravel, and roadfill are rated for each mapping unit.

Topsoil

Topsoil is soil material that is used to improve the surface soil conditions of an area for plant growth and is used for establishing lawns and gardens, and for the revegetation of roadbanks and other landscaped sites. The suitability of a soil for topsoil might influence the decision to stockpile surface soil at construction sites or look for a better source nearby.

The criteria used to determine the degree of suitability are those factors related to the ease or difficulty in obtaining the material (thickness of the material, surface stoniness, slope, and drainage) and the quality of the material (moist consistence, texture, and coarse fragments).

It is assumed that sites from which topsoil is taken must be restored and so the characteristics of the remaining soil material must be adequate for revegetation and erosion control. If restoration is expected to be a problem, the rating is downgraded to poor or unsuitable, depending upon the severity.

Table 20 presents the soil criteria and classes used in making this interpretation.

Gravel

Gravel is used in great quantities in many kinds of construction. The location of significant sources of this material near construction sites can greatly reduce hauling costs.

The soil suitability is rated according to the ease of excavation, which is influenced by the depth of the material, surface stoniness, slope, and soil drainage. Gravel quality is evaluated by considering subsoil texture, coarse fragment content, and gravel hardness.

The ratings are not intended for a specific kind of use but are merely guidelines to help users locate probable sources.

Size, shape, and location of a potential source are not considered as rating criteria.

Table 21 presents the soil criteria and classes used in making this interpretation.

Roadfill

Roadfill is soil material that is excavated from its original position and used as construction material for road foundations and embankments. To minimize hauling costs, much fill is excavated from local soils if it is of acceptable quality.

The suitability of a soil as a source of road fill is dependent upon how easily it can be excavated and how well it performs under use. Soil properties that influence the ease of excavation are slope, surface stoniness, soil drainage, and rockiness. How well the soil performs under use is indicated by the Unified and AASHO classifications, the susceptibility to frost-action, and the shrink-swell potential. All soils in Pictou County except the Stewiacke soils have low or insignificant shrink-swell potential.

Table 22 presents the soil criteria and classes used in making this interpretation.

Table 23 presents, for each map unit, the complete interpretations for soil as a source of material.

Table 20. Soil suitability as a source of topsoil

Soil factors[1] (limitation symbol)	Degree of suitability			
	Good	Fair	Poor	Unsuitable
Moist consistence[2] (c)	very friable, friable	loose, firm	very firm	---
Texture[2] (s)	L,SiL,SL	CL,SiCL	S,LS	organic
Thickness of material (cm) (d)	>40	40-20	20-10	<10
Coarse fragments[2] (% by vol.) (f)	<3	3-15	15-40	>40
Stoniness[2] (p)	0	1	2-3	4-5
Slope (%) (t)	<5	5-9	9-15	>15
Drainage[2] (w)	R,W,MW,I	P	VP	---

Sources: Wang and Rees 1983, United States Department of Agriculture 1976.

[1] Soil factor class codes are defined in Appendix 3.

[2] Day 1983.

Table 21. Soil suitability as a source for gravel

Soil factors[1] (limitation symbol)	Degree of suitability			
	Good	Fair	Poor	Unsuitable
Subsoil texture[2] (s)	VGS gravel	GS,GLS VGLS	VGSL,GSL	all other textures
Coarse fragments[2] (% by vol.) (f)				
- gravel	>60	40-60	20-40	<20
- cobbles	<5	5-15	15-40	>40
Stoniness[2] (p)	0-3	4,5	---	---
Drainage[2] (w)	R,W,MW,W,I	P	VP	---
Gravel hardness (g)	hard[3]	soft[4]	---	---

Sources: Wang and Rees 1983, United States Department of Agriculture 1976.

[1] Soil factor class codes are defined in Appendix 3.

[2] Day 1983.

[3] Within the survey area, deposits specified as being of hard gravel consist mainly of igneous and metamorphic rocks such as granite, quartzite, diorite, basalt, rhyolite, schist and rocks from the Horton Group.

[4] Deposits specified as soft gravel consist mainly of shale, mudstone and siltstone of late Carboniferous origin.

Table 22. Soil suitability as a source for roadfill

Soil factors[1] (limitation symbol)	Degree of suitability			
	Good	Fair	Poor	Unsuitable
Engineering classes[3]: (b)				
- Unified class	GW,GP,SW,SP (GM,GC, SM,SC)[2]	CL (PI<15%)[3] ML,OL,MH CH,OH	CL (PI>15%)	Pt
- AASHO class	A-1,A-2,A-3	A-4,A-5	A-6,A-7	---
Susceptibility to frost action (h)	GW,GP,SW,SP	GM,GC,SM SC,CL	ML,MH	---
Slope (%)[4] (t)	<15	15-30	30-45	>45
Stoniness[4] (p)	0-3	4	5	---
Rockiness[4] (r)	0-1	2	3-4	5
Drainage[4] (w)	R,W,MW	I	P,VP	---

Sources: Wang and Rees 1983, United States Department of Agriculture, 1976.

[1] Soil factor class codes are defined in Appendix 3.

[2] The suitability rating is downgraded to fair if the content of fine soil (material passing No. 200 sieve) is more than 30%.

[3] See Appendix 2 for the description of the Unified and AASHO Engineering Classification System.

[4] Day 1983.

Table 23. SOIL INTERPRETATIONS FOR SOURCE OF MATERIALS

Map symbol	Topsoil	Gravel	Roadfill
By1/C	Pfp	Us	Fh
By1/D	Pfp	Us	Fh
By1/E	Ux	Us	Fh
By1/F	Ut	Us	Fht
By1/G	Ut	Us	Pt
By2/C	Pfp	Us	Fh>Fhw
By2/D	Pfp	Us	Fh>Fhw
By2/E	Ux	Us	Fh>Fhw
By2/F	Ut	Us	Fht>Px
By3/C	Pfp	Us	Fhw
By3/D	Pfp	Us	Fhw
By3/E	Ux	Us	Fhw
By3/F	Ut	Us	Px
Br1/C	Pfp	Us	Fbh
Br1/D	Pfp	Us	Fbh
Br2/C	Pfp	Us	Fbh>Px
Br2/D	Pfp	Us	Fbh>Px
Br2/E	Ux	Us	Fbh>Px
Br2/F	Ut	Us	Px
Br3/B	Pfp	Us	Px
Br3/C	Pfp	Us	Px
Br3/E	Ux	Us	Px
Br3/F	Ut	Us	Px
Br4/C	Pfp	Us	Px>Pw
Br4/D	Pfp	Us	Px>Pw
Ct/A	Us	Us	Ub
Ct/B	Us	Us	Ub
Cd1/C	Pfp	Ps	Fhr
Cd1/D	Pfp	Ps	Fhr
Cd1/E	Ux	Ps	Fhr
Cd1/F	Ut	Ps	Px
Cd2/C	Pfp	Ps	Fhr>Fhw
Cd2/D	Pfp	Ps	Fhr>Fhw
Cd2/E	Ux	Ps	Fhr>Fhw
Cd2/F	Ut	Ps	Px
Cd2/G	Ut	Ps	Pt
Cd3/C	Pfp	Ps	Fhw
Cd3/E	Ux	Ps	Fhw
Cd4/C	Pfp	Ps	Fhw>Pw
Cd5/C	Pfp	Ps	Pw
Cb	Pfs	*NR	NR
Cm3/A	G	G	Fw
Cm3/B	G	G	Fw
Cm3/C	G	G	Fw
Cm4/A	G>Fw	G>Fw	Fw>Pw

(continued)

Table 23. SOIL INTERPRETATIONS FOR SOURCE OF MATERIALS (continued)

Map symbol	Topsoil	Gravel	Roadfill
Cm4/B	G>Fw	G>Fw	Fw>Pw
Cm4/C	G>Fw	G>Fw	Fw>Pw
Cm5/A	Fw	Fw	Pw
Cm5/B	Fw	Fw	Pw
Cm5/C	Fw	Fw	Pw
Hd1/C	Pfp	Ps	Fbh
Hd1/D	Pfp	Ps	Fbh
Hd1/E	Ux	Ps	Fbh
Hd1/F	Ut	Ps	Px
Hd2/B	Pfp	Ps	Fbh>Px
Hd2/C	Pfp	Ps	Fbh>Px
Hd2/D	Pfp	Ps	Fbh>Px
Hd2/E	Ux	Ps	Fbh>Px
Hd2/G	Ut	Ps	Pt
Hd3/B	Pfp	Ps	Px
Hd3/C	Pfp	Ps	Px
Hd3/D	Pfp	Ps	Px
Hd5/B	Pfp	Ps	Pw
Hd5/C	Pfp	Ps	Pw
He1/A	Pf	G	G
He1/B	Pf	G	G
He1/C	Pf	G	G
He1/D	Pf	G	G
He1/E	Pft	G	G
He2/B	Pf	G	G>Fw
He2/C	Pf	G	G>Fw
He2/D	Pf	G	G>Fw
He3/C	Pf	G	Fw
He5/C	Pf	Fw	Pw
He8/B	Pf>G	G	G>Fw
He8/C	Pf>G	G	G>Fw
He8/F	Ut	G	Ft>Fw
Hp1/C	Uf	Us	Fh
Hp1/D	Uf	Us	Fh
Hp1/E	Uf	Us	Fh
Hp2/C	Uf	Us	Fh>Fhw
Hp2/D	Uf	Us	Fh>Fhw
Hp2/E	Uf	Us	Fh>Fhw
Jg4/C	Px	Us	Pb>Pbw
Jg4/E	Pt	Us	Pb>Pbw
Kh1/D	Uf	Ps	Fh
Kh1/E	Uf	Ps	Fh
Kh2/D	Uf	Ps	Fh>Fhw
Kh2/F	Uft	Ps	Fht>Px

(continued)

Table 23. SOIL INTERPRETATIONS FOR SOURCE OF MATERIALS (continued)

Map symbol	Topsoil	Gravel	Roadfill
Kh5/C	Uf	Ps	Pw
Kt1/C	Pfp	Ps	Fh
Kt1/D	Pfp	Ps	Fh
Kt1/E	Ux	Ps	Fh
Kt1/F	Ut	Ps	Fht
Kt1/H	Ut	Ps	Ut
Kt2/C	Pfp	Ps	Fh>Fhw
Kt2/D	Pfp	Ps	Fh>Fhw
Kt2/E	Ux	Ps	Fh>Fhw
Kt2/F	Ut	Ps	Fht>Px
Kt3/B	Pfp	Ps	Fhw
Kt3/C	Pfp	Ps	Fhw
Kt4/C	Pfp	Ps	Fhw>Pw
Mi2/C	Pp	Us	Px>Fbh
Mi2/D	Pp	Us	Px>Fbh
Mi2/E	Ppt	Us	Px>Fbh
Mi2/F	Ut	Us	Px
Mi3/B	Pp	Us	Px
Mi3/C	Pp	Us	Px
Mi3/D	Pp	Us	Px
Mi3/E	Ppt	Us	Px
Mi3/F	Ut	Us	Px
Mi4/B	Pp	Us	Px>Pw
Mi4/C	Pp	Us	Px>Pw
Mi4/D	Pp	Us	Px>Pw
Mi5/C	Pp	Us	Pw
Mi5/D	Pp	Us	Pw
MT	Uf	Uf	NR
Ph1/C	Up	Ps	Px
Ph1/D	Up	Ps	Px
Ph1/E	Up	Ps	Px
Ph2/C	Up	Ps	Px
Ph2/D	Up	Ps	Px
Ph2/E	Up	Ps	Px
Ph4/C	Up	Ps	Px>Pw
Ph4/D	Up	Ps	Px>Pw
Ph5/B	Up	Ps	Pw
Ph5/C	Up	Ps	Pw
Ph7/C	Up	Ps	Px>Pw
Ph7/D	Up	Ps	Px>Pw
Pw2/C	Ffp	Us	Fbh>Px
Pw2/D	Px	Us	Fbh>Px
Pw2/E	Pt	Us	Fbh>Px
Pw3/C	Ffp	Us	Px

(continued)

Table 23. SOIL INTERPRETATIONS FOR SOURCE OF MATERIALS (continued)

Map symbol	Topsoil	Gravel	Roadfill
Pw3/D	Px	Us	Px
Pw3/E	Pt	Us	Px
Pw4/C	Ffp>Px	Us	Px>Pw
Pw4/D	Px	Us	Px>Pw
Pw5/B	Px	Us	Pw
Pw5/C	Px	Us	Pw
Pw5/D	Px	Us	Pw
Pw6/B	Px>Us	Us	Pw>Ub
Pw6/C	Px>Us	Us	Pw>Ub
Qu3/C	Px	Us	Px
Qu3/D	Px	Us	Px
Qu3/E	Pt	Us	Px
Qu4/C	Px	Us	Px>Pw
Qu4/D	Px	Us	Px>Pw
Qu4/E	Pt	Us	Px>Pw
Qu5/B	Px	Us	Pw
Qu5/C	Px	Us	Pw
Qu6/B	Px>Us	Us	Pw>Ub
Qu6/C	Px>Us	Us	Pw>Ub
SM	Pw	Ufs	Phw
Su1/D	Pfp	Ps	Fh
Su1/E	Ux	Ps	Fh
Su2/C	Pfp	Ps	Fh>Fhw
Su2/D	Pfp	Ps	Fh>Fhw
Su2/E	Ux	Ps	Fh>Fhw
Su3/C	Pfp	Ps	Fhw
Su3/D	Pfp	Ps	Fhw
Su5/C	Pfp	Ps	Pw
Se4/C	G>Fw	Us	Ph>Phw
Se5/A	Fw	Us	Phw
Se5/B	Fw	Us	Phw
Se6/A	Fw>Us	Us	Phw>Ub
Se6/B	Fw>Us	Us	Phw>Ub
Tm1/C	Pfp	Ps	Fh
Tm1/D	Pfp	Ps	Fh
Tm1/E	Ux	Ps	Fh
Tm1/F	Ut	Ps	Fht
Tm1/G	Ut	Ps	Pt
Tm2/C	Pfp	Ps	Fh>Fhw
Tm2/D	Pfp	Ps	Fh>Fhw
Tm2/E	Ux	Ps	Fh>Fhw
Tm2/F	Ut	Ps	Fht>Pt
Tm3/C	Pfp	Ps	Fhw
Tm3/D	Pfp	Ps	Fhw

(continued)

Table 23. SOIL INTERPRETATIONS FOR SOURCE OF MATERIALS (continued)

Map symbol	Topsoil	Gravel	Roadfill
Tm3/E	Ux	Ps	Fhw
Tm5/B	Pfp	Ps	Pw
Tm5/C	Pfp	Ps	Pw
Tm5/D	Pfp	Ps	Pw
Wb1/C	Pfp	Ps	Fh
Wb1/D	Pfp	Ps	Fh
Wb1/E	Ux	Ps	Fh
Wb1/F	Ut	Ps	Fht
Wb1/G	Ut	Ps	Pt
Wb1/H	Ut	Ps	Ut
Wb2/D	Pfp	Ps	Fh>Fhw
Wb2/E	Ux	Ps	Fh>Fhw
Wb2/F	Ut	Ps	Fht>Px
Wb2/G	Ut	Ps	Pt
Wo2/D	Pf	Us	Fbh>Px
Wo2/E	Pft	Us	Fbh>Px
Wo2/F	Ut	Us	Px
Wo3/C	Pf	Us	Px
Wo3/D	Pf	Us	Px
Wo3/E	Pft	Us	Px
Wo4/C	Pf	Us	Px>Pw
Wo5/B	Pf	Us	Pw
Wo5/C	Pf	Us	Pw
Wn1/C	Ufp	Ps	Px
Wn1/D	Ufp	Ps	Px
Wn1/E	Ufp	Ps	Px
Wn1/F	Ufp	Ps	Px
Wn2/C	Ufp	Ps	Px
Wn2/D	Ufp	Ps	Px
Wn2/E	Ufp	Ps	Px
Wn2/F	Ufp	Ps	Px
Wn2/G	Ufp	Ps	Pt
Wn3/C	Ufp	Ps	Px
Wn3/D	Ufp	Ps	Px
Wn4/C	Ufp	Ps	Px>Pw
Wn5/B	Ufp	Ps	Pw
Wn5/C	Ufp	Ps	Pw

*NR - not rated

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APPENDICES

APPENDIX 1

LOCAL AND BOTANICAL NAMES OF PLANT SPECIES MENTIONED IN THIS REPORT

(after Roland and Smith 1969)

Local name	Botanical name
Trees	
alder, speckled	*Alnus rugosa* (DuRoi) Spreng
aspen, trembling	*Populus tremuloides* Michx.
beech, American	*Fagus grandifolia* Ehrh.
birch, wire	*Betula populifolia* Marsh.
birch, white	*Betula papyrifera* Marsh.
birch, yellow	*Betula alleghaniensis* Britt.
fir, balsam	*Abies balsamea* (L.)Mill.
hemlock, eastern	*Tsuga canadensis* (L.)Carr
maple, mountain	*Acer spicatum* Lam.
maple, red	*Acer rubrum* L.
maple, sugar	*Acer saccharum* Marsh.
pine, eastern white	*Pinus Strobus* L.
pine, jack	*Pinus Banksiana* Lamb.
pine, red	*Pinus resinosa* Ait.
spruce, black	*Picea mariana* (Mill.)BSP.
spruce, red	*Picea rubens* Sarg.
spruce, white	*Picea glauca* (Moench)Voss.
tamarack	*Larix laricina* (DuRoi)K. Koch
Other plants	
blueberry	*Vaccinium* spp.
bunchberry	*Cornus canadensis* L.
club-moss, bristly	*Lycopodium annotinum* L.
glasswort	*Salicornia europaea* L.
goldthread	*Coptis trifolia* (L.) Salisb.
hazelnut, beaked	*Corylus cornuta* Marsh.
hobblebush	*Viburnum alnifolium* Marsh.
indian cucumber root	*Medeola virginiana* L.
miterwort	*Mitella nuda* L.
mosses, feather	*Pleurozium scheberi* *Hylocomium splendens* *Ptilium crista-castrensis*
mosses, sphagnum	*Sphagnum* spp.
raspberry, wild	*Rubus strigosus* Michx.
rhodora	*Rhododendron canadense* (L.) Torr.
salt-grass	*Distichlis spicata* (L.)Greene
sand-spurrey	*Spergularia marina* (L.) Griseb.
sea-blite	*Suaeda maritima* (L.) Dumort.

(continued)

APPENDIX 1 (continued)

sea-rocket	*Cakile edentula* (Bigel.) Hook.
sedge	*Carex* spp.
sheep laurel	*Kalmia angustifolia* L.
Solomon's seal, false	*Smilacina racemosa* (L.)Desf.
sweet-fern	*Comptonia peregrina* (L.) Coult.
Labrador-tea	*Ledum groenlandicum* Oeder.
violet, dog's-tooth	*Erythronium americanum* Ker
violet, yellow	*Viola eriocarpa* Schwein.
witherod	*Viburnum cassinoides* L.
wintergreen	*Pyrola secunda* L.
wood fern	*Dryopteris spinulosa* (O.F. Muell.)Watt
wood-sorrel	*Oxalis montana* Raf.

APPENDIX 2

PROFILE DESCRIPTIONS AND ANALYSES

Profile descriptions and analyses are given for each of the following:

Moderately well drained BARNEY SOIL
Moderately well drained BRYDEN SOIL
Moderately well drained COBEQUID SOIL
Imperfectly drained CUMBERLAND SOIL
Imperfectly drained HANSFORD SOIL
Rapidly drained HEBERT SOIL
Well drained HOPEWELL SOIL
Poorly drained JOGGINS SOIL
Well drained KIRKHILL SOIL
Moderately well drained KIRKMOUNT SOIL
Imperfectly drained MILLBROOK SOIL
Moderately well drained PERCH LAKE SOIL
Imperfectly drained PUGWASH SOIL
Imperfectly drained QUEENS SOIL
Imperfectly drained SHULIE SOIL
Poorly drained STEWIACKE SOIL
Imperfectly drained THOM SOIL
Well drained WESTBROOK SOIL
Imperfectly drained WOODBOURNE SOIL
Well drained WYVERN SOIL

Table 2-1. Moderately well drained BARNEY SOIL

Location: UTM 20T MF 3110 3480
NTS map: 11E/7
Slope and aspect: 20%; northwest
Site position: upper slope

Landform and parent material: hummocky, loamy skeletal, till
Stoniness: moderately stony
Rockiness: non rocky
Present land use: spruce - fir forest
Classification (1987): Orthic Humo-Ferric Podzol

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color (moist)	Texture	Structure			Consistence	Mottles	Coarse fragments (% vol.)	Roots
				Grade	Size	Kind				
LFH	5-0	dark reddish brown (5YR 2.5/2m)	...poorly decomposed forest litter...							abundant
Ae	0-10	pale brown (10YR 6/3m)	gravelly loam	weak	very fine to fine	subangular blocky	very friable	none	45	abundant
Bf1	10-20	strong brown (7.5YR 4/6m)	gravelly loam	weak	very fine	granular	very friable	none	25	abundant
Bf2	20-38	light olive brown (2.5Y 5/6m)	gravelly loam	weak	fine	subangular blocky	very friable	none	20	plentiful
BC	38-60	olive (5Y 5/3.5m)	gravelly loam	weak	coarse	subangular blocky	friable	none	25	few
Cgj	60-100	olive (5Y 5/3m)	gravelly loam	very weak	coarse	platy	firm	few coarse distinct Fe	40	none

Table 2-1. Moderately well drained BARNEY SOIL (continued)

ANALYSES

Horizon	Depth (cm)	Organic C (%)	Total N (%)	C:N ratio	Exchangeable cations (meq/100 g soil)					Base sat. (%)	Pyrophosphate		Dithionite			Oxalate	
					Ca	Mg	Al	K	CEC		Fe (%)	Al (%)	Fe (%)	Al (%)	Mn (%)	Fe (%)	Al (%)
LFH	5-0	36.36	1.47	24.7	9.83	4.69	3.67	1.59	19.78	81.4	0.15	0.08	0.39	0.09	0.005	0.19	0.09
Ae	0-10	3.29	0.18	18.3	0.78	0.43	5.12	0.09	6.42	20.2	0.39	0.06	1.00	0.09	0.007	0.50	0.10
Bf1	10-20	3.63	0.20	18.15	0.16	0.07	2.89	0.08	3.20	9.7	2.60	0.60	4.85	0.78	0.023	3.33	0.66
Bf2	20-38	2.44	0.15	16.27	0.12	0.03	1.33	0.07	1.55	14.2	1.02	0.63	2.24	0.74	0.011	1.33	0.65
BC	38-60	0.61	0.08	7.63	0.08	0.01	0.72	0.07	0.88	18.2	0.24	0.26	1.15	0.35	0.037	0.37	0.33
Cgj	60-100	0.35	0.06	5.83	0.08	0.01	0.53	0.07	0.69	23.2	0.13	0.17	1.12	0.26	0.052	0.37	0.25

Horizon	pH		Organic matter (%)	Particle size distribution (%)								Coarse fragments (% wt.)	Bulk density (g/cm^3)	USLE K factor
	H_2O	$CaCl_2$		VCS	CS	MS	FS	VFS	Total sand	Silt	Clay			
LFH	4.2	3.6	65.4	-	-	-	-	-	-	-	-	0.0	-	-
Ae	4.0	3.2	5.9	13.9	7.5	2.8	4.8	6.8	35.8	47.6	16.6	61.3	-	0.31
Bf1	4.3	4.0	6.5	18.6	10.4	4.3	6.1	5.8	45.2	34.8	20.0	43.8	1.3	0.16
Bf2	4.8	4.3	[illegible].4	12.2	8.4	4.5	7.5	8.2	40.8	42.6	16.6	28.0	1.6	0.27
BC	5.1	4.3	1.1	15.7	10.3	4.9	7.9	7.2	46.0	36.9	17.1	41.0	1.6	0.35
Cgj	5.2	4.4	0.6	15.1	9.7	4.6	7.6	8.1	45.1	38.1	16.8	48.7	1.8	0.38

Table 2-2. Moderately well drained BRYDEN SOIL

Location: UTM 20T NF 2638 1978
NTS map: 11E/7
Slope and aspect: 5%; southwest
Site position: upper slope

Landform and parent material: undulating, coarse loamy, till
Stoniness: moderately stony
Rockiness: non rocky
Present land use: cutover forest land
Classification (1987): Orthic Humo-Ferric Podzol

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color (moist)	Texture	Structure			Consistence	Mottles	Coarse fragments (% vol.)	Roots
				Grade	Size	Kind				
LFH	7-0	dark reddish brown (5YR 2.5/2m)	...poorly decomposed forest litter...						0	abundant
Ae	0-2	dark brown (7.5YR 3/2m)	gravelly silt loam	weak	very fine	granular	very friable	none	20	abundant
Bf	2-42	strong brown (7.5YR 4/6m)	gravelly loam	weak	very fine	subangular blocky	very friable	none	25	plentiful
BC	42-70	dark yellowish brown (10YR 4/4m)	gravelly sandy loam	moderate	fine	subangular blocky	friable	none	25	few
C	70-100	dark brown (7.5YR 4/4m)	gravelly loam	structureless		massive	friable	none	30	none

Table 2-2. Moderately well drained BRYDEN SOIL (continued)

ANALYSES

Horizon	Depth (cm)	Organic C (%)	Total N (%)	C:N ratio	Exchangeable cations (meq/100 g soil)					Base sat. (%)	Pyrophosphate		Dithionite			Oxalate	
					Ca	Mg	Al	K	CEC		Fe (%)	Al (%)	Fe (%)	Al (%)	Mn (%)	Fe (%)	Al (%)
LFH	7-0	37.01	0.96	38.6	13.70	3.45	0	1.40	18.55	100	-	-	-	-	-	-	-
Ae	0-2	1.99	0.10	19.9	0.17	0.30	3.17	0.10	3.74	15.2	0.06	0.04	0.91	0.10	0.018	0.09	0.08
Bf	2-42	1.61	0.10	16.1	0.09	0.03	0.89	0.07	1.08	17.6	0.75	0.52	2.37	0.67	0.054	0.87	0.60
BC	42-70	0.40	0.05	8.0	0.09	0.01	tr*	0.05	0.15	100	0.15	0.25	1.46	0.32	0.091	0.27	0.35
C	70-100	0.06	0.01	6.0	0.07	0.01	tr	0.03	0.11	100	0.09	0.17	1.12	0.11	0.033	0.19	0.22

Horizon	pH		Organic matter (%)	Particle size distribution (%)								Coarse fragments (% wt.)	Bulk density (g/cm^3)	USLE K factor
	H_2O	$CaCl_2$		VCS	CS	MS	FS	VFS	Total sand	Silt	Clay			
LFH	4.0	3.3	66.6	-	-	-	-	-	-	-	-	0	-	-
Ae	4.1	3.0	3.6	8.0	4.6	3.1	7.2	10.1	33.0	53.4	13.6	38	-	0.10
Bf	5.1	4.5	2.9	7.2	5.5	3.9	8.0	9.6	34.2	45.1	20.7	36	1.0	0.33
BC	5.2	4.6	0.7	14.8	9.0	5.8	10.9	12.3	52.8	33.4	13.8	35	1.7	0.39
C	5.4	4.7	0.1	13.5	11.1	6.9	8.8	11.4	51.7	35.2	13.1	39	1.8	-

Table 2-3. Moderately well drained COBEQUID SOIL

Location: UTM 20T NF 4883 3465
NTS map: 11E/8
Slope and aspect: 2%; north
Site position: middle slope

Landform and parent material: hummocky, loamy skeletal, till
Stoniness: very stony
Rockiness: non rocky
Present land use: maple, yellow birch, red spruce, fir, wood fern forest
Classification (1987): Orthic Ferro-Humic Podzol

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color (moist)	Texture	Structure			Consistence	Mottles	Coarse fragments (% vol.)	Roots
				Grade	Size	Kind				
LFH	19-0	dark reddish brown (5YR 2.5/2m)	...poorly decomposed mixed wood forest litter...							abundant
Ae	0-12	dark brown (10YR 4/3m)	very gravelly loam	weak	fine	subangular blocky	friable	none	60	plentiful
Bhf	12-57	dark brown (7.5YR 3/4m)	very gravelly loam	weak	very fine to fine	subangular blocky	very friable	none	60	plentiful
BCgj	57-71	dark brown (7.5YR 4/4m)	very gravelly sandy loam	very weak	very fine to fine	subangular blocky	friable	few fine faint Fe	55	very few
Cgj	71-100	dark yellowish brown (10YR 4/4m)	gravelly sandy loam	structureless		massive	friable	few fine faint Fe	35	none

Table 2-3. Moderately well drained COBEQUID SOIL (continued)

ANALYSES

Horizon	Depth (cm)	Organic C (%)	Total N (%)	C:N ratio	Exchangeable cations (meq/100 g soil)					Base sat. (%)	Pyrophosphate		Dithionite			Oxalate	
					Ca	Mg	Al	K	CEC		Fe (%)	Al (%)	Fe (%)	Al (%)	Mn (%)	Fe (%)	Al (%)
LFH	19-0	42.48	2.01	21.1	14.10	4.44	0.72	1.01	20.27	96.4	-	-	-	-	-	-	-
Ae	0-12	2.15	0.12	17.9	0.70	0.28	4.25	0.10	5.33	20.3	0.35	0.12	0.90	0.13	0.003	0.34	0.16
Bhf	12-57	8.80	0.36	24.4	0.18	0.10	2.28	0.09	2.65	14.0	2.70	2.12	3.94	2.37	0.040	3.11	2.73
BCgj	57-71	1.31	0.05	26.2	0.10	0.02	0.86	0.05	1.03	16.5	0.25	0.48	1.13	0.73	0.021	0.55	0.89
Cgj	71-100	0.84	0.05	16.8	0.90	0.01	Tr	0.06	0.97	100	0.24	0.29	1.44	0.39	0.007	0.58	0.44

Horizon	pH		Organic matter (%)	Particle size distribution (%)								Coarse fragments (% wt.)	Bulk density (g/cm^3)	USLE K factor
	H_2O	$CaCl_2$		VCS	CS	MS	FS	VFS	Total sand	Silt	Clay			
LFH	3.4	3.1	76.5	-	-	-	-	-	-	-	-	0	-	-
Ae	3.6	3.2	3.9	9.3	6.3	3.6	6.4	12.4	38.0	43.9	18.1	76	-	0.31
Bhf	4.6	4.2	15.8	12.2	10.5	5.1	6.9	10.5	45.2	40.9	13.9	70	1.3	0.31
BCgj	5.1	4.5	2.4	17.5	11.7	6.7	10.1	10.5	56.5	32.8	10.7	64	1.6	0.34
Cgj	5.1	4.5	1.5	14.7	11.7	7.4	11.7	10.6	56.1	28.5	15.4	47	1.8	0.33

Table 2-4. Imperfectly drained CUMBERLAND SOIL

Location: UTM 20T NF 3135 3060
NTS map: 11E/7
Slope and aspect: 0%;
Site position: level

Landform and parent material: coarse loamy active floodplain
Stoniness: non stony
Rockiness: non rocky
Present land use: forage
Classification (1987): Gleyed Regosol

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color (moist)	Texture	Structure			Consistence	Mottles	Coarse fragments (% vol.)	Roots
				Grade	Size	Kind				
Apgj	0-22	dark brown (10YR 3/3.5m)	loam	moderate to strong	fine	subangular blocky	friable	few fine faint Fe	5	abundant
Cgj	22-70	dark yellowish brown (10YR/ 4/4m)	loam	weak	medium to coarse	prismatic	friable	many medium to coarse distinct Fe	15	plentiful
C	70-100	dark brown (10YR 3/3m)	very gravelly sandy loam	structureless		single grain	very friable	none	80	few

Table 2-4. Imperfectly drained CUMBERLAND SOIL (continued)

ANALYSES

Horizon	Depth	Organic C	Total N	C:N ratio	Exchangeable cations (meq/100 g soil)					Base sat.	Pyrophosphate		Dithionite			Oxalate	
	(cm)	(%)	(%)		Ca	Mg	Al	K	CEC	(%)	Fe (%)	Al (%)	Fe (%)	Al (%)	Mn (%)	Fe (%)	Al (%)
Apgj	0-22	2.58	0.28	9.2	5.94	0.42	tr	0.10	6.46	100	0.53	0.18	1.42	0.26	0.098	0.81	0.25
Cgj	22-70	1.22	0.14	8.7	4.13	0.31	tr	0.08	4.52	100	0.51	0.17	1.49	0.27	0.148	0.77	0.25
C	70-100	0.51	0.06	8.5	2.51	0.22	tr	0.09	2.82	100	0.32	0.12	1.31	0.21	0.091	0.58	0.19

Horizon	pH		Organic matter	Particle size distribution (%)								Coarse fragments	Bulk density	USLE K factor
	H_2O	$CaCl_2$	(%)	VCS	CS	MS	FS	VFS	Total sand	Silt	Clay	(% wt.)	(g/cm^3)	
Apgj	5.0	4.4	4.6	1.6	2.7	3.7	11.2	13.4	32.6	44.4	23.0	1	1.1	0.34
Cgj	5.1	4.5	2.2	1.1	6.5	7.1	14.5	12.2	41.4	41.6	17.0	7	1.1	0.38
C	5.5	4.8	0.9	25.1	22.9	13.3	9.9	4.4	75.5	14.1	10.4	67	-	0.23

Table 2-5. Imperfectly drained HANSFORD SOIL

Location: UTM 20T NF 2895 5555
NTS map: 11E/10E
Slope and aspect: 6%; southwest
Site position: middle slope

Landform and parent material: rolling, coarse loamy, till
Stoniness: moderately stony
Rockiness: non rocky
Present land use: black spruce, red maple, white birch - forest
Classification (1987): Fragic Humo-Ferric Podzol

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color (moist dry)	Texture	Structure			Consistence	Mottles	Coarse fragments (% vol.)	Roots
				Grade	Size	Kind				
LFH	6-0	...poorly decomposed mixed wood forest litter...								abundant
Ae	0-10	light gray (10YR 7.5/1d)	sandy loam	very weak	very fine	granular	loose	none	5	abundant
Bf	10-27	dark yellowish brown (10YR 4/6d)	gravelly sandy loam	very weak	fine	subangular blocky	soft	none	35	abundant
BCxgj	27-60	dark brown (7.5YR 4/4d)	sandy loam	moderate	coarse	platy	very hard	common medium distinct Fe	15	few
Cxgj	60-100	dark reddish brown (5YR 3/4m)	gravelly sandy loam	structureless		massive	very firm	common medium distinct Fe	30	none

Table 2-5. Imperfectly drained HANSFORD SOIL (continued)

ANALYSES

Horizon	Depth	Organic C	Total N	C:N ratio	Exchangeable cations (meq/100 g soil)					Base sat.	Pyrophosphate		Dithionite			Oxalate	
	(cm)	(%)	(%)		Ca	Mg	Al	K	CEC	(%)	Fe (%)	Al (%)	Fe (%)	Al (%)	Mn (%)	Fe (%)	Al (%)
LFH	6-0	22.56	0.74	30.5	5.76	2.47	9.99	1.31	19.53	48.8	0.31	0.16	0.84	0.21	0.013	0.50	0.21
Ae	0-10	0.49	0.02	24.5	0.21	0.07	1.36	0.06	1.70	20.0	0.02	0.02	0.12	0.03	0.003	0.03	0.02
Bf	10-27	2.34	0.12	19.5	0.25	0.06	2.14	0.08	2.53	15.4	0.35	0.74	1.50	0.95	0.015	0.47	1.13
BCxgj	27-60	0.15	0.02	7.5	0.11	0.02	1.39	0.08	1.60	13.1	0.07	0.10	0.86	0.15	0.052	0.22	0.17
Cxgj	60-100	0.17	0.02	8.5	0.12	0.03	2.31	0.09	2.55	9.4	0.07	0.09	1.08	0.14	0.063	0.26	0.13

Horizon	pH		Organic matter	Particle size distribution (%)								Coarse fragments	Bulk Density	USLE K factor
	H_2O	$CaCl_2$	(%)	VCS	CS	MS	FS	VFS	Total sand	Silt	Clay	(% wt.)	(g/cm^3)	
LFH	3.7	3.3	40.6	-	-	-	-	-	-	-	-	0	-	-
Ae	3.9	3.3	0.9	2.1	14.2	19.6	25.3	10.9	72.1	21.4	6.5	7	1.3	0.18
Bf	5.0	3.2	4.2	3.6	8.3	11.8	20.7	11.8	56.2	31.5	12.3	48	1.1	0.29
BCxgj	5.0	4.4	0.3	2.7	8.2	11.5	22.4	10.4	55.2	29.5	15.3	24	1.7	0.40
Cxgj	4.7	4.2	0.3	3.0	8.7	13.7	20.0	9.3	54.7	28.9	16.4	38	1.8	0.37

Table 2-6. Rapidly drained HEBERT SOIL

Location: UTM 20T NF 2091 1872
NTS map: 11E/7
Slope and aspect: 15%; south
Site position: middle slope

Landform and parent material: hummocky, sandy skeletal, glaciofluvial, sediments
Stoniness: moderately stony
Rockiness: non rocky
Present land use: spruce - fir forest
Classification (1987): Orthic Humo-Ferric Podzol

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color (moist)	Texture	Structure			Consistence	Coarse fragments (% vol.)	Roots
				Grade	Size	Kind			
LFH	3-0	very dusky red (2.5YR 2.5/2m)	...poorly decomposed mixed wood forest litter...						abundant
Ae	0-3	brown (10YR 5/3m)	sandy loam	weak	fine	granular	very friable	0	abundant
Bf	3-21	dark yellowish brown (10YR 3/6m)	gravelly loam	weak	fine	granular	very friable	20	abundant
BC	21-59	dark yellowish brown (10YR 3/3.5m)	gravelly loamy sand	very weak	fine	granular	very friable	35	few
C	59-100	dark brown (10YR 3/3m)	gravelly sand	structureless		single grain	loose	40	very few

Table 2-6. Rapidly drained HEBERT SOIL (continued)

ANALYSES

Horizon	Depth (cm)	Organic C (%)	Total N (%)	C:N ratio	Exchangeable cations (meq/100 g soil)					Base sat. (%)	Pyrophosphate		Dithionite			Oxalate	
					Ca	Mg	Al	K	CEC		Fe (%)	Al (%)	Fe (%)	Al (%)	Mn (%)	Fe (%)	Al (%)
LFH	3-0	22.40	1.12	20.0	6.18	2.66	4.67	1.25	14.76	68.4	0.34	0.14	0.97	0.20	0.342	0.47	0.18
Ae	0-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bf	3-21	3.06	0.18	17.0	0.11	0.05	1.72	0.06	1.94	11.3	0.82	0.83	1.98	0.88	0.073	0.94	0.92
BC	21-59	0.52	0.06	8.7	0.09	0.02	0.64	0.06	0.81	21.0	0.13	0.23	1.18	0.26	0.110	0.29	0.35
C	59-100	0.35	0.03	11.7	0.09	0.02	0.70	0.06	0.87	19.5	0.05	0.12	1.27	0.21	0.128	0.31	0.24

Horizon	pH		Organic Matter (%)	Particle size distribution (%)								Coarse fragments (% wt.)	Bulk Density (g/cm^3)	USLE K factor
	H_2O	$CaCl_2$		VCS	CS	MS	FS	VFS	Total sand	Silt	Clay			
LFH	4.2	3.6	40.3	-	-	-	-	-	-	-	-	0.0	-	-
Ae	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Bf	4.7	4.2	5.5	11.6	10.1	6.7	12.7	5.0	46.1	41.3	12.6	30.6	1.2	0.16
BC	5.2	4.4	0.9	25.6	28.1	13.8	10.7	3.9	82.1	9.9	8.0	53.5	1.3	0.07
C	5.2	4.3	0.6	28.2	35.3	14.7	10.5	3.5	92.2	0.3	7.5	42.8	1.2	0.06

Table 2-7. Well drained HOPEWELL SOIL

Location: UTM 20T NF 2017 3658
NTS map: 11E/7
Slope and aspect: 10%; northwest
Site position: middle slope

Landform and parent material: hummocky, loamy skeletal, till veneer
Stoniness: very stony
Rockiness: slightly rocky
Present land use: sugar maple, yellow birch, fir - wood fern forest
Classification (1987): Sombric Humo-Ferric Podzol

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color (moist)	Texture	Structure			Consistence	Mottles	Coarse fragments (% volume)	Roots
				Grade	Size	Kind				
L	1-0	...poorly decomposed mixed wood forest litter...								
Ah	0-16	dark reddish brown (5YR 3/4m)	gravelly silt loam	moderate	fine to medium	granular	friable	none	50	abundant
Bf1	16-48	strong brown (7.5YR 4/6m)	very gravelly silt loam	very weak	fine	granular	very friable	none	60	abundant
Bf2	48-75	strong brown (7.5YR 4/6m)	gravelly loam	very weak	very fine to fine	granular	friable	none	40	plentiful
R	75+	...reddish brown fine grain Carboniferous sandstone bedrock...								

Table 2-7. Well drained HOPEWELL SOIL (continued)

ANALYSES

Horizon	Depth (cm)	Organic C (%)	Total N (%)	C:N ratio	Exchangeable cations (meq/100 g soil)					Base sat. (%)	Pyrophosphate		Dithionite			Oxalate	
					Ca	Mg	Al	K	CEC		Fe (%)	Al (%)	Fe (%)	Al (%)	Mn (%)	Fe (%)	Al (%)
Ah	0-16	7.35	0.46	15.9	4.03	1.01	2.42	0.22	7.68	68.5	1.10	0.40	2.09	0.38	0.044	1.34	0.44
Bf1	16-48	2.90	0.18	16.1	0.54	0.21	2.17	0.07	2.99	27.4	1.32	0.81	2.78	0.82	0.023	2.00	0.86
Bf2	48-75	2.47	0.14	17.6	0.36	0.21	2.00	0.10	2.67	25.1	1.06	0.69	2.19	0.68	0.022	1.35	0.69
R	75+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Horizon	pH		Organic matter (%)	Particle size distribution (%)								Coarse fragments (% wt.)	Bulk Density (g/cm^3)	USLE K factor
	H_2O	$CaCl_2$		VCS	CS	MS	FS	VFS	Total sand	Silt	Clay			
L	-	-	-	-	-	-	-	-	-	-	-	0	-	-
Ah	4.9	4.2	13.2	5.1	4.2	1.5	2.1	6.7	19.5	55.5	24.9	59	1.1	0.20
Bf1	5.2	4.2	5.2	10.4	5.6	1.7	1.6	5.5	24.8	53.5	21.7	70	1.3	0.23
Bf2	5.7	4.1	4.4	10.4	7.6	2.9	2.4	5.1	28.4	47.2	24.4	53	1.5	0.20
R	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 2-8. Poorly drained JOGGINS SOIL

Location: UTM 20T NF 2940 5165
NTS map: 11E/10E
Slope and aspect: 4%; northwest
Site position: mid slope

Landform and parent material: rolling, fine clayey, till
Stoniness: non stony
Rockiness: non rocky
Present land use: mixed wood forest
Classification (1987): Orthic Luvic Gleysol

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color (moist dry)	Texture	Structure			Consistence	Mottles	Coarse fragments (% volume)	Roots
				Grade	Size	Kind				
LFH	9-0	dark reddish brown (5YR 3/2d)	...poorly decomposed forest litter...							abundant
Aeg	0-23	yellowish brown (10YR 5.5/6d)	loam	weak	coarse	subangular blocky	friable	many medium distinct Fe	5	plentiful
Btg	23-45	grayish brown (10YR 5/2m)	clay loam	moderate	medium	prismatic	very firm	many coarse prominent Fe	1	few
Cg	45-100	dark grayish brown (10YR 4/2m)	clay loam	weak	coarse	platy	very firm	common medium distinct Fe	15	none

Table 2-8. Poorly drained JOGGINS SOIL (continued)

ANALYSES

Horizon	Depth (cm)	Organic C (%)	Total N (%)	C:N ratio	Exchangeable cations (meq/100 g soil)					Base sat. (%)	Pyrophosphate		Dithionite			Oxalate	
					Ca	Mg	Al	K	CEC		Fe (%)	Al (%)	Fe (%)	Al (%)	Mn (%)	Fe (%)	Al (%)
LFH	9-0	22.92	1.06	21.6	13.25	3.45	8.97	1.49	27.16	67.0	0.26	0.15	0.77	0.17	0.021	0.47	0.18
Aeg	0-23	0.74	0.06	12.3	0.33	0.18	2.43	0.08	3.02	19.5	0.48	0.13	1.78	0.23	0.000	0.61	0.16
Btg	23-45	0.52	0.05	10.4	0.82	0.45	2.66	0.11	4.04	34.2	0.16	0.10	2.30	0.22	0.027	0.44	0.14
Cg	45-100	0.59	0.08	7.4	7.52	2.20	0.00	0.12	9.84	100	0.02	0.02	2.33	0.16	0.078	0.19	0.09

Horizon	pH		Organic matter (%)	Particle size distribution (%)								Coarse fragments (% wt.)	Bulk Density (g/cm^3)	Hydraulic conductivity (cm/h)	USLE K factor
	H_2O	$CaCl_2$		VCS	CS	MS	FS	VFS	Total sand	Silt	Clay				
LFH	4.3	3.7	41.3	-	-	-	-	-	-	-	-	0	-	-	-
Aeg	4.9	4.1	1.3	1.1	3.7	6.5	14.0	14.6	39.9	39.0	21.1	9	1.4	5.4	0.45
Btg	5.0	4.1	0.9	1.5	3.2	5.0	10.4	10.4	30.5	39.6	29.9	3	1.6	0.05	0.40
Cg	6.5	6.0	1.1	3.5	3.9	2.9	6.4	7.9	23.6	39.3	37.1	20	1.9	0.0	0.39

Table 2-9. Well drained - KIRKHILL SOIL

Location: UTM 20T NF 2585 2590
NTS map: 11E/7
Slope and aspect: 10%; southeast
Site position: upper slope

Landform and parent material: hummocky, loamy skeletal till
Stoniness: moderately stony
Rockiness: non rocky
Present land use: red spruce, fir, sugar maple, white birch, feather moss, forest
Classification (1987): Orthic Humo-Ferric Podzol

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color (moist)	Texture	Structure			Consistence	Coarse fragments (% vol.)	Roots
				Grade	Size	Kind			
LFH	7-0	...poorly decomposed mixed wood forest litter...							abundant
Ae	0-10	light gray (10YR 6.5/1m)	gravelly sandy loam	very weak	very fine	subangular blocky	friable	45	plentiful
Bf	10-45	strong brown (7.5YR 4/6m)	gravelly loam	weak	fine	subangular blocky	friable	45	plentiful
BC	45-70	dark yellowish brown (10YR 3/4m)	very gravelly sandy loam	weak	fine	subangular blocky	friable	60	few
C	70-100	very dark grayish brown (2.5Y 3/2M)	very gravelly loamy sand	structureless		massive	friable	75	none

Table 2-9. Well drained KIRKHILL SOIL (continued)

ANALYSES

Horizon	Depth (cm)	Organic C (%)	Total N (%)	C:N ratio	Exchangeable cations (meq/100 g soil)					Base sat. (%)	Pyrophosphate		Dithionite			Oxalate	
					Ca	Mg	Al	K	CEC		Fe (%)	Al (%)	Fe (%)	Al (%)	Mn (%)	Fe (%)	Al (%)
LFH	7-0	34.23	1.09	31.4	7.05	0.16	7.00	2.29	16.50	57.6	0.20	0.13	0.61	0.15	0.04	0.33	0.15
Ae	0-10	1.37	0.12	11.4	0.19	0.07	4.29	0.08	4.63	7.3	0.21	0.05	0.64	0.08	0.01	0.25	0.08
Bf	10-45	3.76	0.20	18.8	0.14	0.06	2.61	0.07	2.88	9.4	1.50	0.93	4.05	1.01	0.093	2.73	1.02
BC	45-70	0.58	0.06	9.7	0.23	0.02	0.32	0.04	0.60	48.3	0.09	0.19	1.11	0.33	0.12	0.41	0.43
C	70-100	0.40	0.07	5.7	0.15	0.02	1.30	0.16	1.63	20.2	0.06	0.14	1.33	0.29	0.18	0.54	0.38

Horizon	pH		Organic matter (%)	Particle size distribution (%)								Coarse fragments (% wt.)	Bulk density (g/cm^3)	USLE K factor
	H_2O	$CaCl_2$		VCS	CS	MS	FS	VFS	Total sand	Silt	Clay			
LFH	3.8	3.3	61.6	-	-	-	-	-	-	-	-	-	-	-
Ae	3.8	3.3	2.5	6.0	5.0	2.8	6.6	10.6	31.0	53.1	15.9	47	-	0.42
Bf	4.8	4.3	6.8	11.7	8.5	5.1	9.0	10.4	44.7	41.9	13.4	44	1.4	0.27
BC	4.9	4.5	1.0	26.9	15.4	6.6	8.0	6.3	63.2	21.4	15.4	62	1.6	0.18
C	5.1	4.8	0.7	43.5	18.5	5.8	6.2	4.1	78.1	18.0	3.9	75	1.7	0.15

Table 2-10. Moderately well drained - KIRKMOUNT SOIL

Location: UTM 20T NF 4169 4069
NTS map: 11E/9
Slope and aspect: 7%; west
Site position: crest

Landform and parent material: hummocky, loamy skeletal, till
Stoniness: moderately stony
Rockiness: non rocky
Present land use: spruce-fir forest
Classification (1987): Orthic Humo-Ferric Podzol

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color (moist dry)	Texture	Structure			Consistence	Mottles	Coarse fragments (% volume)	Roots
				Grade	Size	Kind				
LFH	5-0	...poorly decomposed forest litter...								abundant
Ah	0-9	pale brown (10YR 6/3d)	gravelly loam	very weak	medium	subangular blocky	friable	none	25	abundant
Bf1	9-31	yellowish brown (10YR 5/8d)	gravelly loam	very weak	medium	subangular blocky	very friable	none	40	abundant
Bf2	31-47	yellowish brown (10YR 5/6d)	gravelly sandy loam	weak	coarse	subangular blocky	very friable	none	45	plentiful
Cgj	47-64	reddish brown (5YR 5/3d)	very gravelly sandy loam	structureless		massive	friable	few, fine faint Fe	55	very few
C	64-100	yellowish brown (10YR 5/4d)	gravelly sandy loam	structureless		massive	friable	none	40	none

Table 2-10. moderately well drained KIRKMOUNT SOIL (continued)

ANALYSES

Horizon	Depth (cm)	Organic C (%)	Total N (%)	C:N ratio	Exchangeable cations (meq/100 g soil)					Base sat. (%)	Pyrophosphate		Dithionite			Oxalate	
					Ca	Mg	Al	K	CEC		Fe (%)	Al (%)	Fe (%)	Al (%)	Mn (%)	Fe (%)	Al (%)
LFH	5-0	30.65	1.28	24.0	11.85	4.07	7.17	2.08	25.17	71.5	0.12	0.10	0.34	0.14	0.06	0.24	0.15
Ah	0-9	5.18	0.23	22.5	0.55	0.45	13.2	0.11	14.31	7.8	0.85	0.35	1.45	0.34	0.01	1.09	0.45
Bf1	9-31	3.81	0.18	21.2	0.26	0.11	4.17	0.11	4.65	10.3	1.20	0.72	2.16	0.81	0.02	1.70	0.91
Bf2	31-47	3.83	0.20	19.2	0.20	0.04	2.06	0.12	2.42	14.9	0.95	1.06	2.19	1.40	0.03	1.44	1.42
BCgj	47-64	0.46	0.04	11.5	0.22	0.02	0.53	0.05	0.82	35.4	0.06	0.18	0.65	0.32	0.04	0.21	0.51
C	64-100	0.21	0.03	7.0	0.27	0.04	0.47	0.06	0.84	44.0	0.04	0.12	0.72	0.22	0.06	0.18	0.29

Horizon	pH		Organic matter (%)	Particle size distribution (%)								Coarse fragments (% wt.)	Bulk density (g/cm^3)	USLE K factor
	H_2O	$CaCl_2$		VCS	CS	MS	FS	VFS	Total sand	Silt	Clay			
LFH	3.7	3.3	55.17	-	-	-	-	-	-	-	-	0.0	-	-
Ah	4.1	3.7	9.32	9.7	6.4	3.8	6.4	7.6	33.9	44.5	21.6	39.7	-	0.30
Bf1	4.6	4.2	6.86	17.1	10.4	4.9	7.1	7.3	46.8	35.2	18.0	54.8	1.3	0.23
Bf2	4.8	4.4	6.89	17.2	14.7	7.3	10.1	9.3	58.6	24.8	16.6	58.8	-	0.20
BCgj	5.1	4.7	0.83	19.3	13.9	7.9	11.3	9.6	62.0	26.3	11.7	67.2	1.6	0.34
C	5.4	4.7	0.38	20.9	12.0	6.4	10.5	9.7	59.5	26.0	14.5	49.3	1.7	0.36

Table 2-11. Imperfectly drained - MILLBROOK SOIL

Location: UTM 20T NF 4529 2021
MTS map: 11E/8
Slope and aspect: 7%; south

Landform and parent material: rolling, fine loamy, till
Stoniness: moderately stony
Rockiness: non rocky
Present land use: fir, red maple, red spruce - feather moss forest
Classification (1987): Gleyed Humo-Ferric Podzol

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color (moist)	Texture	Structure			Consistence	Mottles	Coarse fragments (% vol.)	Roots
				Grade	Size	Kind				
LFH	6-0	... poorly decomposed mixedwood forest litter...								abundant
Ae	0-5	brown (7.5YR 5/4m)	gravelly silt loam	moderate	medium	subangular blocky	firm	none	30	plentiful
Bf	5-19	strong brown (7.5YR 4/6m)	loam	weak to moderate	coarse	subangular blocky	friable	none	10	abundant
Bfgj	19-34	dark brown (7.5YR 4/4m)	sandy loam	weak	coarse	platy	friable	few medium faint Fe	10	few
BCg	34-60	dark reddish brown (5YR 3/4m)	loam	strong	medium	subangular blocky	friable to firm	common coarse prominent Fe	10	none
Cg	60-100	dark reddish brown (5YR 3/4m)	gravelly loam	weak	coarse	subangular blocky	very firm	common coarse prominent Fe	20	none

Table 2-11. Imperfectly drained MILLBROOK SOIL (continued)

ANALYSES

Horizon	Depth (cm)	Organic C (%)	Total N (%)	C:N ratio	Exchangeable cations (meq/100 g soil)					Base sat. (%)	Pyrophosphate		Oxalate		
					Ca	Mg	Al	K	CEC		Fe (%)	Al (%)	Fe (%)	Al (%)	Mn (%)
LFH	6-0	31.46	1.06	29.7	7.50	2.47	5.33	1.52	16.82	68.3	0.23	0.16	0.27	0.18	-
Ae	0-5	1.98	0.10	19.8	0.28	0.22	6.03	0.06	6.59	8.5	0.18	0.10	0.20	0.17	-
Bf	5-19	3.87	0.23	16.8	0.76	0.19	5.63	0.09	6.67	15.6	1.70	0.60	2.02	0.64	-
Bf$_{gj}$	19-34	1.43	0.09	15.9	0.08	0.04	1.55	0.04	1.71	9.4	0.67	0.37	0.90	0.42	0.02
BC$_g$	34-60	0.57	0.05	11.4	0.08	0.03	1.19	0.05	1.35	11.9	0.24	0.24	0.46	0.33	0.04
C$_g$	60-100	0.38	0.05	7.6	0.15	0.09	1.50	0.06	1.80	16.7	0.07	0.13	0.36	0.22	0.07

Horizon	pH		Organic matter (%)	Particle size distribution (%)			Bulk density (g/cm^3)	Hydraulic conductivity (cm/h)
	H_2O	$CaCl_2$		Total sand	Silt	Clay		
LFH	3.7	3.2	56.6	-	-	-	-	-
Ae	3.8	3.2	3.6	31.3	52.7	16.0	-	-
Bf	4.2	3.8	7.0	28.6	46.7	24.7	0.8	-
Bf$_{gj}$	4.6	4.2	2.6	57.1	30.2	12.7	1.5	1.9
BC$_g$	4.8	4.3	1.0	44.2	36.1	19.7	1.7	0.5
C$_g$	4.9	4.2	0.7	34.7	42.4	22.9	1.8	0.2

Table 2-12. Moderately well drained - PERCH LAKE SOIL

Location: UTM 20T NF 2729 1726
NTS map: 11E/7
Slope and aspect: 6%; northwest
Site position: upper slope

Landform and parent material: hummocky, loamy skeletal, till
Stoniness: very stony
Rockiness: non rocky
Present land use: young plantation of spruce and pine
Classification (1987): Orthic Humo-Ferric Podzol

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color (moist dry)	Texture	Structure			Consistence	Mottles	Coarse fragments (% vol.)	Roots
				Grade	Size	Kind				
LFH	5-0	dark reddish brown (5YR 3/2d)	...poorly decomposed forest litter...							abundant
Ae	0-7	grayish brown (10YR 5/2d)	very gravelly loam	weak	fine	subangular blocky	very friable	none	50	abundant
Bf1	7-22	strong brown (7.5YR 4/6m)	gravelly sandy loam	weak	fine	subangular blocky	very friable	none	35	abundant
Bf2	22-56	strong brown (7.5YR 5/7m)	gravelly sandy loam	weak	fine	subangular blocky	very friable	none	40	plentiful
BCgj	56-87	dark brown (7.5YR 4/4)	gravelly sandy loam	moderate	medium	subangular blocky	friable	few, fine distinct Fe	30	very few
C	87-100	dark brown (10YR 4/3m)	gravelly sandy loam	structureless		massive	friable	none	35	none

Table 2-12. Moderately well drained PERCH LAKE SOIL (continued)

ANALYSES

Horizon	Depth (cm)	Organic C (%)	Total N (%)	C:N ratio	Exchangeable cations (meq/100 g soil)					Base sat. (%)	Pyrophosphate		Dithionite			Oxalate	
					Ca	Mg	Al	K	CEC		Fe (%)	Al (%)	Fe (%)	Al (%)	Mn (%)	Fe (%)	Al (%)
LFH	5-0	40.90	1.30	31.5	2.85	0.74	0.0	1.34	4.93	100	-	-	-	-	-	-	-
Ae	0-7	1.43	0.08	17.9	0.46	0.31	3.0	0.12	3.89	22.9	0.07	0.03	0.81	0.07	0.015	0.07	0.07
Bf1	7-22	3.70	0.16	23.1	0.15	0.05	1.0	0.09	1.29	22.5	1.21	0.96	3.00	1.14	0.049	1.71	1.07
Bf2	22-56	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BCgj	56-87	0.46	0.03	15.3	0.08	0.01	tr	0.06	0.15	100	0.15	0.18	1.23	0.32	0.073	0.30	0.27
C	87-100	0.29	0.03	9.7	0.08	0.01	tr	0.07	0.16	100	0.06	0.17	1.37	0.29	0.096	0.21	0.28

Horizon	pH		Organic matter (%)	Particle size distribution (%)								Coarse fragments (% wt.)	Bulk Density (g/cm^3)	USLE K factor
	H_2O	$CaCl_2$		VCS	CS	MS	FS	VFS	Total sand	Silt	Clay			
LFH	4.3	3.8	73.6	-	-	-	-	-	-	-	-	-	0	-
Ae	4.0	3.4	2.6	8.3	7.4	5.9	14.1	13.8	49.5	37.0	13.5	65	-	0.35
Bf1	4.9	4.4	6.7	12.9	11.5	7.8	14.8	11.2	58.2	26.9	14.9	54	1.4	0.26
Bf2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BCgj	5.3	4.6	0.8	16.4	9.5	6.3	13.7	12.8	58.7	32.5	8.8	34	1.6	0.40
C	5.2	4.5	0.5	16.6	12.3	7.6	11.5	11.0	59.0	27.1	13.9	47	1.8	0.33

Table 2-13. Imperfectly drained - PUGWASH SOIL

Location: UTM 20T NF 1310 4674
NTS map: 11E/10W
Slope and aspect: 7%; east
Site position: toe

Landform and parent material: rolling, coarse loamy, till
Stoniness: slightly stony
Rockiness: non rocky
Present land use: fir, white birch - wood fern forest
Classification (1987): Gleyed Sombric Brunisol

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color (moist)	Texture	Structure			Consistence	Mottles	Coarse fragments (% vol.)	Roots
				Grade	Size	Kind				
LFH	8-0	...moderately decomposed mixedwood forest litter...								abundant
Ahej	0-16	dark reddish brown (5YR 3/4m)	loam	weak	medium	subangular blocky	very friable	none	0	plentiful
Bmgj	16-38	yellowish red (5YR 4/6m)	sandy loam	weak	coarse	subangular blocky	very friable	few coarse faint Fe	5	few
BCxgj	38-85	dark reddish brown (5YR 3/4m)	sandy loam	weak	coarse	platy	firm	common coarse faint Fe	15	none
Cgj	85-100	dark reddish brown (5YR 3/4m)	sandy loam	structureless		massive	friable	few coarse faint Fe	15	none

Table 2-13. Imperfectly drained PUGWASH SOIL (continued)

ANALYSES

Horizon	Depth (cm)	Organic C (%)	Total N (%)	C:N ratio	Exchangeable cations (meq/100 g soil)					Base sat. (%)	Pyrophosphate		Dithionite			Oxalate	
					Ca	Mg	Al	K	CEC		Fe (%)	Al (%)	Fe (%)	Al (%)	Mn (%)	Fe (%)	Al (%)
LFH	8-0	19.20	0.96	20.0	0.58	0.23	0.56	0.10	1.47	61.9	0.48	0.17	1.04	0.22	0.358	0.83	0.21
Ahej	0-16	2.04	0.10	20.4	0.53	0.38	3.34	0.09	4.34	23.0	0.35	0.13	1.14	0.16	0.253	0.71	0.17
Bmgj	16-38	0.54	0.04	13.5	0.29	0.07	1.03	0.04	1.43	28.0	0.17	0.10	0.65	0.15	0.012	0.25	0.13
BCxgj	38-85	0.13	0.02	6.5	2.94	0.53	-	0.08	3.55	100	0.02	0.01	0.81	0.07	0.042	0.10	0.05
Cgj	85-100	0.10	0.01	10.0	2.03	0.16	-	0.07	2.26	100	0.01	0.01	0.92	0.06	0.093	0.07	0.04

Horizon	pH		Organic matter (%)	Particle size distribution (%)								Coarse fragments (% wt.)	Bulk density (g/cm^3)	Hydraulic conductivity (cm/h)	USLE K factor
	H_2O	$CaCl_2$		VCS	CS	MS	FS	VFS	Total sand	Silt	Clay				
LFH	4.3	3.6	34.6	-	-	-	-	-	-	-	-	0	-	-	-
Ahej	4.6	3.9	3.7	1.5	1.7	3.2	22.5	22.2	51.1	33.2	15.7	0	1.4	0.67	0.37
Bmgj	5.1	4.2	1.0	0.9	1.0	2.5	29.3	24.9	58.6	31.3	10.1	13.9	1.6	0.89	0.52
BCxgj	5.8	5.3	0.2	1.5	1.6	3.7	29.9	25.3	62.0	23.4	14.6	23.2	1.8	0.03	0.50
Cgj	6.1	5.2	0.2	3.7	2.9	5.0	31.5	24.7	67.8	21.8	10.4	22.3	2.0	0.03	0.50

Table 2-14. Imperfectly drained - QUEENS SOIL

Location: UTM 20T NF 9705 6840
NTS map: 11E/14E
Slope and aspect: 5%; south
Site position: upper slope

Landform and parent material: rolling, fine loamy, till
Stoniness: non stony
Rockiness: non rocky
Present land use: forage
Classification (1987): Gleyed Brunisolic Gray Luvisol

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color (moist)	Texture	Structure			Consistence	Mottles	Coarse fragments (% vol.)	Roots
				Grade	Size	Kind				
Ap	0-15	dark reddish brown (5YR 3/4m)	silt loam	moderate	coarse	subangular blocky	friable	none	3	abundant
Bmgj	15-28	reddish brown (5YR 4/4m)	clay loam	strong	coarse	subangular blocky	friable	common medium faint Fe	5	plentiful
Btgj1	28-60	dark reddish brown (5YR 3/4m)	clay loam	strong	very coarse	subangular blocky	very firm	common medium faint Fe	5	plentfiful
Btgj2	60-78	dark reddish brown (2.5YR 3/4m)	silt loam	moderate to strong	coarse	subangular blocky	very firm	few fine faint Fe	5	few
Cgj	78-100	dark reddish brown (2.5YR 3/4m)	clay loam	structureless		massive	very firm	few fine faint Fe	-	none

Table 2-14 Imperfectly drained QUEENS SOIL (continued)

ANALYSES

Horizon	Depth (cm)	Organic C (%)	Exchangeable cations (meq/100 g soil)					Base sat. (%)	Pyrophosphate		Oxalate		
			Ca	Mg	Al	K	CEC		Fe (%)	Al (%)	Fe (%)	Al (%)	Mn (%)
Ap	0-15	1.7	3.91	1.26	0.50	0.12	5.79	91.4	0.28	0.12	0.51	0.14	-
Bmgj	15-28	0.3	2.12	1.11	1.33	0.09	4.65	71.4	0.24	0.12	0.50	0.16	0.02
Btgj1	28-60	0.0	1.68	0.88	3.14	0.13	5.83	46.1	0.08	0.09	0.41	0.15	0.01
Btgj2	60-78	0.02	2.24	1.05	2.11	0.11	5.51	61.7	0.04	0.07	0.31	0.12	0.04
Cgj	78-100	0.02	5.25	1.99	0.33	0.13	7.70	95.7	0.02	0.04	0.19	0.08	0.05

Horizon	pH		Organic Matter (%)	Particle size distribution (%)								Coarse fragments (% wt.)	Bulk Density (g/cm^3)	Hydraulic Conductivity (cm/h)	USLE K factor
	H_2O	$CaCl_2$		VCS	CS	MS	FS	VFS	Total sand	Silt	Clay				
Ap	4.8	4.7	3.0	0.9	1.5	5.4	10.5	8.1	26.4	53.9	19.7	6	1.3	3.9	0.36
Bmgj	4.9	4.6	0.5	0.6	1.4	4.9	9.1	7.3	23.3	48.4	28.3	9	1.7	7.2	0.43
Btgj1	4.7	4.3	0	0.6	1.1	4.7	9.0	6.4	21.8	49.4	28.8	7	1.7	2.8	0.44
Btgj2	4.7	4.3	0.04	1.0	1.3	4.6	8.9	7.6	23.4	49.9	26.7	8	1.8	3.5	0.45
Cgj	5.1	4.7	0.04	1.2	1.5	4.8	9.9	8.0	25.4	46.3	28.3	-	2.0	0.8	0.50

Table 2-15. Imperfectly drained - SHULIE SOIL

Location: UTM 20T MF 3022 5342
NTS map: 11E/10E
Slope and aspect: 4%; southeast
Site position: middle slope

Landform and parent material: hummocky, loamy skeletal, till
Stoniness: slightly stony
Rockiness: non rocky
Present land use: aspen - feather moss forest
Classification (1987): Gleyed Eluviated Dystric Brunisol

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color (moist dry)	Texture	Structure			Consistence	Mottles	Coarse fragments (% vol.)	Roots
				Grade	Size	Kind				
LFH	4-0	dark grayish brown (10YR 4/2d)	...poorly decomposed forest litter...							abundant
Ae	0-5	light brownish gray (10YR 6/2d)	gravelly sandy loam	weak	very fine to fine	granular	loose	none	20	plentiful
Bm1	5-20	yellowish brown (10YR 5.5/6d)	gravelly sandy loam	very weak	fine	granular	loose	none	25	plentiful
Bm2	20-48	dark yellowish brown (10YR 4/4d)	gravelly sandy loam	weak	coarse	platy	soft	none	40	plentiful
BCgj	48-80	dark brown (10YR 3.5/3d)	gravelly sandy loam	weak	medium	subangular blocky	soft	common medium distinct Fe	30	few
Cxgj	80-100	dark brown (7.5YR 4/4m)	gravelly sandy loam	weak	coarse	platy	firm	common coarse distinct Fe	35	none

Table 2-15. Imperfectly drained SHULIE SOIL (continued)

ANALYSES

Horizon	Depth (cm)	Organic C (%)	Total N (%)	C:N ratio	Exchangeable cations (meq/100 g soil)					Base sat. (%)	Pyrophosphate		Dithionite			Oxalate	
					Ca	Mg	Al	K	CEC		Fe (%)	Al (%)	Fe (%)	Al (%)	Mn (%)	Fe (%)	Al (%)
LFH	4-0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ae	0-5	0.30	0.04	7.5	0.69	0.25	1.80	0.07	2.81	35.9	0.03	0.03	0.11	0.004	0.05	0.04	0.04
Bm1	5-20	0.59	0.04	14.8	0.11	0.02	0.66	0.09	0.88	25.0	0.12	0.22	0.77	0.035	0.12	0.50	0.45
Bm2	20-48	0.13	0.02	6.5	0.12	0.03	0.91	0.06	1.12	18.8	0.05	0.08	0.44	0.013	0.35	0.17	0.14
BCgj	48-80	0.11	0.02	5.5	0.11	0.03	0.77	0.05	0.96	19.8	0.04	0.05	0.54	0.028	0.09	0.20	0.09
Cxgj	80-100	0.13	0.02	6.5	0.11	0.08	1.77	0.06	2.02	12.4	0.05	0.05	0.71	0.024	0.10	0.27	0.10

Horizon	pH		Organic matter (%)	Particle size distribution (%)								Coarse fragments (% wt.)	Bulk density (g/cm^3)	USLE K factor
	H_2O	$CaCl_2$		VCS	CS	MS	FS	VFS	Total sand	Silt	Clay			
LFH	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ae	4.4	3.7	0.5	1.6	15.3	24.6	22.9	9.9	74.3	15.2	10.5	29.2	-	0.13
Bm1	4.3	4.6	1.1	3.6	13.5	21.1	20.6	10.6	69.3	18.2	12.5	25.6	1.3	0.18
Bm2	5.4	4.7	0.2	4.6	10.8	13.3	24.7	12.7	66.1	22.7	11.2	54.4	1.5	0.34
BCgj	4.8	4.4	0.2	3.6	13.2	17.8	27.7	12.0	74.3	15.1	10.6	43.0	1.7	0.28
Cxgj	5.4	4.2	0.2	3.9	11.7	15.7	27.4	12.0	70.7	16.4	12.9	52.1	1.9	0.28

Table 2-16. Poorly drained - STEWIACKE SOIL

Location: UTM 20T MF 0410 5802
NTS map: 11E/10W
Slope and aspect: 0%; level
Site position: level

Landform and parent material: fine loamy, active floodplain
Stoniness: non stony
Rockiness: non rocky
Present land use: improved pasture/forage
Classification (1987): Rego Gleysol

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color (moist)	Texture	Structure			Consistence	Mottles	Coarse fragments (% vol.)	Roots
				Grade	Size	Kind				
Ap	0-18	dark reddish brown (5 YR 3/3m)	silt loam	moderate	fine	subangular blocky	friable	none	0	abundant
Cg1	18-80	dark reddish brown (5YR 3/3m)	silt loam	moderate	medium to coarse	subangular blocky	friable	common medium prominent Fe	0	few
Cg2	80-100	reddish brown (5YR 3/m)	silty clay loam	structureless		massive	firm	many	0	none

Table 2-16. Poorly drained STEWIACKE SOIL (continued)

ANALYSES

Horizon	Depth (cm)	Organic C (%)	Total N (%)	C:N ratio	Exchangeable cations (meq/100 g soil)					Base sat. (%)
					Ca	Mg	Al	K	CEC	
Ap	0-18	2.24	0.19	11.8	4.80	2.01	4.17	0.11	11.09	62.4
Cg1	18-80	0.39	0.05	7.8	2.35	1.19	1.20	8.77	13.51	91.1
Cg2	80-100	0.35	0.05	7.0	4.41	1.73	0.72	0.13	6.99	89.7

Horizon	pH		Organic matter (%)	Particle size distribution (%)								Coarse fragments (% wt.)	Bulk Density (g/cm^3)	Hydraulic conductivity (cm/h)	USLE K factor
	H_2O	$CaCl_2$		VCS	CS	MS	FS	VFS	Total sand	Silt	Clay				
Ap	5.2	4.4	4.0	0.5	0.3	1.0	5.3	13.1	20.2	55.3	24.5	0	1.1	5.2	0.45
Cg1	5.4	4.5	0.7	0.8	1.4	2.9	10.4	14.7	30.2	51.2	18.6	0	1.4	3.8	0.56
Cg2	5.2	4.5	0.6	0.6	0.8	0.9	2.1	6.7	11.1	61.1	27.8	0	1.5	0.7	0.52

Table 2-17. Imperfectly drained - THOM SOIL

Location: UTM 20T NF 1814 3317
NTS map: 11E/7
Slope and aspect: 4%; southwest
Site position: mid slope

Landform and parent material: loamy skeletal, till
Stoniness: slightly stony
Rockiness: non rocky
Present land use: fir, hemlock, red maple - feather moss forest
Classification (1987): Gleyed Humo-Ferric Podzol

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color (moist)	Texture	Structure			Consistence	Mottles	Coarse fragments (% vol.)	Roots
				Grade	Size	Kind				
LFH	6-0	...poorly decomposed mixedwood forest litter...								abundant
Ae	0-5	light brown (7.5YR 6/4m)	gravelly silt loam	weak	coarse	platy	very friable	none	30	plentiful
Bf1	5-20	strong brown (7.5YR 4/6m)	gravelly silt loam	weak	medium	subangular blocky	very friable	none	30	plentiful
Bf2	20-35	dark brown (7.5YR 4/4m)	gravelly loam	weak	fine	subangular blocky	very friable	none	35	few
BCgj	35-70	dark brown (10YR 4/3m)	gravelly loam	very weak	coarse	platy	friable	few fine distinct Fe	30	few
Cgj	70-100	dark brown (10YR 4/3.5m)	gravelly sandy loam	weak	coarse	subangular blocky	firm	few coarse distinct Fe	40	very few

Table 2-17. Imperfectly drained THOM SOIL (continued)

ANALYSES

Horizon	Depth (cm)	Organic C (%)	Total N (%)	C:N ratio	Exchangeable cations (meq/100 g soil)					Base sat. (%)	Pyrophosphate		Dithionite			Oxalate	
					Ca	Mg	Al	K	CEC		Fe (%)	Al (%)	Fe (%)	Al (%)	Mn (%)	Fe (%)	Al (%)
LFH	8-0	29.63	0.80	37.0	9.15	2.98	4.67	1.50	18.28	74.5	-	-	-	-	-	-	-
Ae	0-5	5.13	0.16	32.1	4.95	0.41	10.54	0.18	16.08	34.5	0.45	0.18	1.55	0.19	0.028	0.81	0.28
Bf1	5-20	2.56	0.12	21.3	9.00	2.71	4.83	1.46	18.00	73.2	1.37	0.46	3.20	0.54	0.050	2.37	0.63
Bf2	20-35	1.00	0.10	10.0	0.17	0.04	1.33	0.12	1.66	19.8	0.41	0.40	1.50	0.46	0.035	0.67	0.51
BCgj	35-70	0.40	0.06	8.2	0.08	0.04	1.63	0.08	1.65	11.9	0.36	0.25	1.43	0.28	0.042	0.82	0.32
Cgj	70-100	0.21	0.04	5.3	0.33	0.34	1.85	0.12	2.64	29.9	0.12	0.10	1.30	0.16	0.088	0.51	0.18

Horizon	pH		Organic matter (%)	Particle size distribution (%)								Coarse fragments (% wt.)	Bulk Density (g/cm^3)	Hydraulic conductivity (cm/h)	USLE K factor
	H_2O	$CaCl_2$		VCS	CS	MS	FS	VFS	Total sand	Silt	Clay				
LFH	3.8	3.5	50.3	-	-	-	-	-	-	-	-	0	-	-	-
Ae	3.8	4.2	8.8	3.2	1.7	1.0	1.8	3.4	11.4	78.2	10.4	45.1	-	-	0.41
Bf1	4.4	4.2	4.6	6.5	4.7	2.6	3.4	5.9	23.1	50.0	26.9	42.3	1.4	28.8	0.31
Bf2	4.7	4.2	1.8	16.0	10.2	4.1	5.2	8.2	43.7	37.8	18.5	48.5	1.5	10.6	0.37
BCgj	4.8	4.3	0.8	17.5	13.1	5.7	6.4	8.4	51.1	31.3	17.6	38.4	1.7	4.2	0.23
Cgj	5.1	4.1	0.4	18.8	13.1	6.6	7.8	7.7	54.1	29.0	16.7	52.8	1.8	2.5	0.31

Table 2-18. Well drained - WESTBROOK SOIL

Location: UTM 20T MF 1632 4783
NTS map: 11E/10W
Slope and aspect: 6%; east
Site position: upper slope

Landform and parent material: loamy skeletal, till veneer
Stoniness: non stony
Rockiness: non rocky
Present land use: white spruce on old abandoned farmland
Classification (1987): Orthic Sombric Brunisol

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color (moist)	Texture	Structure			Consistence	Coarse fragments (% vol.)	Roots
				Grade	Size	Kind			
LF	5-0								abundant
Ahej	0-17	dark brown (7.5YR 3/4m)	clay loam	moderate	medium	granular	friable	10	abundant
Bm	17-50	yellowish red (5YR 4/6m)	very gravelly sandy loam	weak	fine	subangular blocky	friable	30	plentiful
BC	50-70	dark reddish brown (2.5YR 3/4m)	very gravelly sandy loam	weak	fine	subangular blocky	friable	55	plentiful
R	70+	...purplish conglomerate bedrock...							none

Table 2-18. Well drained WESTBROOK SOIL (continued)

ANALYSES

Horizon	Depth (cm)	Organic C (%)	Total N (%)	C:N ratio	Exchangeable cations (meq/100 g soil)					Base sat. (%)	Pyrophosphate		Dithionite			Oxalate	
					Ca	Mg	Al	K	CEC		Fe (%)	Al (%)	Fe (%)	Al (%)	Mn (%)	Fe (%)	Al (%)
LF	5-0	16.56	0.70	23.7	25.13	2.50	7.00	0.61	37.33	92.0	0.27	0.24	1.26	0.20	0.240	0.40	0.26
Ahej	0-17	4.14	0.33	12.5	5.86	0.71	0.67	0.26	7.30	90.0	0.43	0.30	2.04	0.37	0.333	0.85	0.39
Bm	17-50	0.74	0.09	8.2	4.39	0.32	tr	0.11	4.82	100	0.20	0.12	1.70	0.21	0.171	0.46	0.21
BC	50-70	0.15	0.04	3.8	3.46	0.26	tr	0.09	3.81	100	0.09	0.06	1.61	0.15	0.148	0.28	0.12
R	70+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Horizon	pH		Organic matter (%)	Particle size distribution (%)								Coarse fragments (% wt.)	Bulk density (g/cm³)	USLE K factor
	H_2O	$CaCl_2$		VCS	CS	MS	FS	VFS	Total sand	Silt	Clay			
LF	5.3	4.8	28.6	-	-	-	-	-	-	-	-	0	-	-
Ahej	5.1	4.7	7.5	4.3	3.2	1.5	5.0	15.2	29.2	40.8	30.0	21.0	1.4	0.21
Bm	5.8	5.0	1.3	16.4	11.1	4.1	7.4	14.8	53.8	26.1	20.0	60.0	1.7	0.30
BC	5.4	5.0	0.3	16.2	17.1	6.8	11.3	12.8	64.3	20.3	15.4	60.0	-	0.30
R	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 2-19. Imperfectly drained - WOODBOURNE SOIL

Location: UTM 20T NF 2355 3915
NTS map: 11E/10E
Slope and aspect: 6%; east

Landform and parent material: hummocky, loamy skeletal, till veneer
Stoniness: slightly stony
Rockiness: non rocky
Present land use: spruce - fir forest
Classification (1987): Gleyed Humo-Ferric Podzol

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color (moist)	Texture	Structure			Consistence	Mottles	Coarse fragments (% vol.)	Roots
				Grade	Size	Kind				
LFH	6-0	...poorly decomposed forest litter...								abundant
Ahjej	0-10	reddish brown (5YR 4/3m)	gravelly silt loam	moderate	medium	granular	friable	few, fine faint Fe	25	plentiful
Bfgj	10-31	yellowish red (5YR 3.5/6m)	gravelly silt loam	weak	fine	subangular blocky	friable	few, fine faint Fe	45	few
BCgj	31-60	dark reddish brown (5YR 3/4m)	gravelly clay loam	weak	medium	subangular blocky	firm	few, fine faint Fe	40	very few
Cg	60-100	dark reddish brown (5YR 3/4m)	gravelly clay loam	structureless		massive	very firm	common, fine distinct Fe	40	none

Table 2-19. Imperfectly drained WOODBOURNE SOIL (continued)

ANALYSES

Horizon	Depth (cm)	Organic C (%)	Total N (%)	C:N ratio	Exchangeable cations (meq/100 g soil)					Base sat. (%)	Pyrophosphate		Dithionite			Oxalate	
					Ca	Mg	Al	K	CEC		Fe (%)	Al (%)	Fe (%)	Al (%)	Mn (%)	Fe (%)	Al (%)
LFH	6-0	14.19	0.45	31.5	4.01	1.18	6.38	0.45	14.0	40.3	0.51	0.21	1.40	0.22	0.008	0.58	0.25
Ahjej	0-10	2.78	0.14	19.9	1.31	0.41	5.28	0.31	7.3	27.7	0.59	0.24	1.88	0.22	0.016	0.73	0.28
Bfgj	10-31	2.55	0.15	17.0	0.23	0.05	3.49	0.11	3.9	10.5	0.80	0.88	1.96	0.70	0.008	0.89	0.77
BCgj	31-60	0.17	0.03	5.7	0.17	0.11	3.71	0.15	4.1	9.5	0.07	0.13	1.66	0.14	0.051	0.29	0.20
Cg	60-100	0.10	0.01	10.0	3.44	0.75	tr	0.08	4.2	100	0.01	0.01	0.90	0.06	0.067	0.10	0.05

Horizon	pH		Organic matter (%)	Particle size distribution (%)								Coarse fragments (% wt.)	USLE K factor
	H_2O	$CaCl_2$		VCS	CS	MS	FS	VFS	Total sand	Silt	Clay		
LFH	4.0	3.4	25.5	-	-	-	-	-	-	-	-	0	-
Ahje	4.9	4.0	5.0	4.0	2.3	1.1	2.3	8.4	18.1	55.1	26.8	32.0	0.24
Bfgj	4.9	4.1	4.6	2.3	5.1	2.4	2.8	6.1	18.7	58.8	22.5	62.3	0.35
BCgj	4.8	4.0	0.3	11.6	7.1	3.3	4.2	5.9	32.1	39.9	28.0	55.8	0.36
Cg	5.0	4.1	0.2	6.7	8.5	4.2	4.1	6.2	29.7	41.0	29.3	59.0	0.32

Table 1-20. Well drained - WYVERN SOIL

Location: UTM 20T NF 6275 3960
NTS map: 11E/9
Slope and aspect: 50%; west
Site position: toe

Landform and parent material: hummocky, loamy skeletal, till
Stoniness: excessively stony
Rockiness: non rocky
Present land use: red spruce, sugar maple, yellow birch, beech - wood fern forest
Classification (1987): Orthic Humo-Ferric Pozol

PROFILE DESCRIPTION

Horizon	Depth (cm)	Color (moist)	Texture	Structure			Consistence	Coarse fragments (% vol.)	Roots
				Grade	Size	Kind			
LFH	9-0	very dusky red (2.5YR 2.5/2m)	...poorly decomposed mixed wood forest litter...						abundant
Ae	0-15	light reddish brown (5YR 5.5/3m)	gravelly sandy loam	weak	fine	subangular blocky	very friable	15	plentiful
Bf1	15-32	dark brown (7.5YR 3/4m)	gravelly sandy loam	moderate	fine	subangular blocky	very friable	35	plentiful
Bf2	32-55	strong brown (7.5YR 4/6m)	gravelly loam	weak	medium	subangular blocky	very friable	35	few
BC	55-87	dark yellowish brown (10YR 4/4m)	very gravelly sandy loam	weak	very fine	subangular blocky	friable	70	very few
C	87-100	dark yellowish brown (10YR 4/4m)	gravelly sandy loam	structureless		massive	friable	45	none

Table 2-20. Well drained WYVERN SOIL (continued)

ANALYSES

Horizon	Depth (cm)	Organic C (%)	Total N (%)	C:N ratio	Exchangeable cations (meq/100 g soil)					Base sat. (%)	Pyrophosphate		Dithionite			Oxalate	
					Ca	Mg	Al	K	CEC		Fe (%)	Al (%)	Fe (%)	Al (%)	Mn (%)	Fe (%)	Al (%)
LFH	9-0	20.78	1.54	13.4	6.55	3.82	8.0	0.96	11.4	29.8	0.09	0.15	0.21	0.19	0.011	0.13	0.17
Ae	0-15	2.18	0.14	15.5	0.47	0.27	5.28	0.09	6.1	13.4	0.14	0.10	0.43	0.08	0.004	0.14	0.15
Bf1	15-32	4.16	0.34	12.2	0.89	0.28	0.53	0.02	1.7	68.8	1.41	1.89	2.73	2.69	0.025	2.04	3.25
Bf2	32-55	3.43	0.21	16.3	0.31	0.07	tr	0.06	0.4	100	0.37	0.89	1.13	1.54	0.005	0.72	1.89
BC	55-87	0.74	0.04	18.5	0.12	0.02	tr	0.04	0.2	100	0.06	0.27	0.46	0.50	0.018	0.17	0.58
C	87-100	0.46	0.04	11.5	0.15	0.03	tr	0.05	0.2	100	0.05	0.20	0.30	0.31	0.012	0.13	0.44

Horizon	pH		Organic matter (%)	Particle size distribution (%)								Coarse fragments (% wt.)	USLE K factor
	H_2O	$CaCl_2$		VCS	CS	MS	FS	VFS	Total sand	Silt ▲	Clay		
LFH	3.8	3.1	37.4	-	-	-	-	-	-	-	-	0	-
Ae	4.3	3.4	3.9	21.8	16.0	7.3	8.1	6.2	59.3	28.1	12.6	27	0.20
Bf1	5.1	4.4	7.5	24.0	15.7	7.7	8.7	7.5	63.5	25.7	10.7	60	0.17
Bf2	5.2	4.5	6.2	18.9	13.7	7.8	10.1	1.5	52.0	38.9	9.1	49	0.26
BC	5.2	4.5	1.3	21.0	18.9	9.2	10.5	7.1	66.8	25.2	8.0	83	0.28
C	5.4	4.5	0.8	21.9	18.1	9.6	11.5	1.4	62.6	30.8	6.6	56	0.30

APPENDIX 3

GLOSSARY OF TERMS AND ABBREVIATIONS

This glossary covers terms and abbreviations used in Appendix 2 and the interpretive guideline tables. For more information see Day (1983) and Agriculture Canada (1976).

Al Aluminum.

Base sat. (%) Base saturation percent is the extent to which the cation exchange complex of the soil is saturated with exchangeable cations other than hydrogen and aluminum.

Bulk density (g/cm^3) The mass of dry soil per unit bulk volume measured in grams per cubic centimetre.

Ca Calcium.

CEC Cation exchange capacity is the total amount of exchangeable cations that a soil can absorb. In this report CEC is the sum of the exchangeable cations recorded in meq/100 g soil. (see also exchangeable cations).

Coarse fragment (% wt.) Mineral soil particles >2 mm are measured as a percentage of the total weight of a soil sample.

Coarse fragments (% volume) See texture.

C:N ratio The ratio of the weight of organic carbon to the weight of total nitrogen in the soil is obtained by dividing the % organic carbon by the % total nitrogen.

Color The Munsell color system specifies the relative degrees of three variables of color: hue, value, and chroma. For example 5YR-3/4 is the color of a soil having a hue of 5YR, value of 3, and chroma of 4. The Munsell system also assigns a name to the notation, "dark reddish brown." Colors are recorded on moist(m) or dry(d) soil.

Consistence The resistance of the soil material to deformation or rupture (i.e. its strength). Terms used to describe consistence depend on the moisture of the soil.

Drainage Soil drainage classes are defined in terms of available water storage capacity and source of water. Soil drainage in a dynamic sense refers to the rapidity and extent of removal of water from soils in relation to additions. It is affected by a number of factors that act separately or in combination, including texture, structure, slope gradient, slope length, water holding capacity and evapotranspiration.

Rapidly Drained (R) Water is removed from the soil rapidly in relation to supply. Excess water flows downward if underlying material is pervious. Subsurface flow may occur on steep gradients during heavy rainfall. Soils have low available water storage capacity (2.5-4 cm) within the control section and are usually coarse textured, or shallow, or both. Water source is precipitation.

Well Drained (W) Water is removed from the soil readily but not rapidly. Excess water flows downward readily into underlying pervious material or laterally as subsurface flow. Soils have intermediate available water storage capacity (4-5 cm) within the control section and are generally intermediate in texture and depth. Water source is precipitation. On slopes subsurface flow may occur for short durations but additions are equaled by losses.

Moderately Well Drained (MW) Water is removed from the soil somewhat slowly in relation to supply. Excess water is removed somewhat slowly because of low perviousness, shallow water table, lack of gradient, or some combination of these. Soils have intermediate to high water storage capacity (5-6 cm) within the control section and are usually medium to fine textured. Precipitation is the dominant water source in medium to fine textured soils; precipitation and significant additions by subsurface flow are necessary in coarse textured soils.

Imperfectly Drained (I) Water is removed from the soil sufficiently slowly in relation to supply to keep the soil wet for a significant part of the growing season. Excess water moves slowly downward if precipitation is the major supply. If subsurface water or groundwater, or both, is the main source, flow rate may vary but the soil remains wet for a significant part of the growing season. Precipitation is the main source if available water storage capacity is high; contribution by subsurface flow or groundwater flow, or both, increases as available water storage capacity decreases. Soils have a wide range in available water supply, texture, and depth and are gleyed equivalents of well drained subgroups.

Poorly Drained (P) Water is removed so slowly in relation to supply that the soil remains wet for a comparatively large part of the time the soil is not frozen. Excess water is evident in the soil for a large part of the time. Subsurface flow or groundwater flow or both, in addition to precipitation are main water sources; there may also be a perched water table, and precipitation may exceed evapotranspiration. Soils have a wide range in available water storage capacity, texture, and depth, and are gleyed subgroups, Gleysols, or Organic.

Very Poorly Drained (VP) Water is removed from the soil so slowly that the water table remains at or on the surface for the greater part of the time the soil is not frozen. Excess water is present in the soil for the greater part of the time. Groundwater flow and subsurface flow are major water sources. Precipitation is less important except where there is a perched water table with precipitation exceeding evapotranspiration. Soils have a wide range in available water storage capacity, texture, and depth, and are either Gleysolic or Organic.

Exchangeable cations (meq/100 g soil) Positive ions held or absorbed on negatively charged sites on mineral or organic particles, which in total are referred to as the exchange complex of the soil. Quantitatively, these amounts are conventionally expressed in milliequivalents per 100 grams of soil (meq/100 g). One milliequivalent is the amount of an element or compound that will combine with or replace one milligram of hydrogen. (See Al, Ca, CEC, K, Mg, and Na.)

Fe Iron.

Horizon A soil layer approximately parallel to the land surface, which differs from other layers in properties such as color, texture, structure, and consistence and in chemical, biological, and physical properties.

Hydraulic conductivity (cm/h) The ability of the soil to transmit water vertically when saturated, expressed as a velocity in centimetres per hour.

K Potassium

Mg Magnesium

Mn Manganese

Mottles Spots or blotches of different color or shades of color (usually reds, oranges, or reddish browns) interspersed with the dominant soil color. Mottles are oxides of iron and are indicative of soils that have been periodically saturated.

Na Sodium

Organic C (%) Percentage by weight carbon present in the soil as a constituent in soil organic matter.

Organic matter (%) The organic fraction of the soil as a percentage; including plant and animal residues at various stages of decomposition and substances synthesized by the soil population.

Particle size distribution (%) Percentage of the various soil separates in a soil sample. The abbreviations, names and sizes of the separates are as follows:

VCS	very coarse sand (2-1 mm)
CS	coarse sand (2-0.5 mm)
MS	medium sand (0.5-0.25 mm)
FS	fine sand (0.25-0.1 mm)
VFS	very fine sand (0.1-0.05 mm)
Total sand	all the above (2-0.05 mm)
Silt	(0.05-0.002 mm)
Clay	(<0.002 mm)

pH The negative logarithm of the hydrogen ion activity of the soil. The degree of acidity or alkalinity of the soil measured in water (H_2O) or in a solution of calcium chloride ($CaCl_2$).

Rockiness Rockiness refers to bedrock outcropping at the earth's surface. Bedrock outcrops are incapable of supporting crops and interfere with the efficient operation of farm machinery. Classes are distinguished on the percentage of surface area covered by exposed bedrock and are defined in terms of the amount of surface covered by bedrock and the distance between bedrock exposures as follows:

Class name	Class	Surface covered(%)	Distance between outcrops (m)
Nonrocky	0	<2	>100
Slightly rocky	1	2-10	35-100
Moderately rocky	2	10-25	10-35
Very rocky	3	25-50	3.5-10
Exceedingly rocky	4	50-90	<3.5
Excessively rocky	5	>90	

Stoniness Refers to the rock fragments on the surface of the soils or those protruding above ground. Stony soils interfere with the efficient operation of farm machinery for cultivation, seedbed preparation, and harvesting. Farming stony land increases the wear and frequency of repair on farming implements. The degree of limitation that stones impose is related to their number, size, and spacing at the soil surface. The following classes are defined in terms of the amount of surface stones greater than 25 cm in diameter (or greater than 38 cm if flat), and their spacing:

Class name	Class	Surface covered (%)	Distance between stones (m)
Nonstony	0	<0.01	>25
Slightly stony	1	0.01-0.1	8-25
Moderately stony	2	0.1-3	1-8
Very stony	3	3-15	0.5-1
Exceedingly stony	4	15-50	0.1-0.5
Excessively stony	5	>50	<0.1

Structure Refers to the aggregation of primary soil particles into compound particles, units, or peds. Peds are classified on the basis of the size, shape, or kind and degree of distinctness or grade. Structure in this report refers to primary structure.

Texture Relative proportions of the soil separates (sand, silt, and clay) in a soil as described by the classes of soil texture shown in the textural triangle (see Fig. 35).

S	sand
LS	loamy sand
SL	sandy loam
L	loam
SiL	silt loam
Si	silt
SCL	sandy clay loam
CL	clay loam
SiCL	silty clay loam
SC	sandy clay
SiC	silty clay
C	clay

The names of textural classes may be modified by adding the following terms when significant amounts of coarse fragments are present (particles >2 mm):

G	gravelly (20-50% by volume)
VG	very gravelly (50-90% by volume)

Total N (%) Percentage by weight of total nitrogen present in the soil.

USLE K factor The Universal Soil Loss Equation (USLE) soil erodibility factor (K) is the soil loss rate per erosion index unit for a specified soil as measured on a unit plot, which is defined as a 72.6 ft length of uniform 9% slope continuously in clean tilled fallow (Wischmeier et al. 1971). The K factor has been determined by use of the soil-erodibility nomograph (Fig. 32).

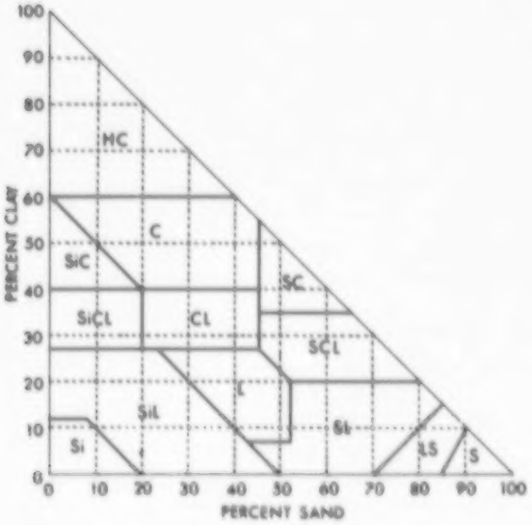

100
90
80
70
60
50
40
30
20
10
0
PERCENT CLAY
HC
C
SiC
SC
SiCL
CL
SCL
L
SiL
Si
SL
LS
S
0
10
20
30
40
50
60
70
80
90
100
PERCENT SAND

Fig. 35. Soil textural triangle. Percentages of clay and sand in the main textural classes of soils; the remainder of each class is silt.

APPENDIX 4

ENGINEERING SOIL CLASSIFICATION AND DATA

UNIFIED SOIL CLASSIFICATION SYSTEM

The unified soil classification system classifies soils according to their value as construction material. In this system soils are grouped on the basis of particle size distribution, plasticity, liquid limit, and organic matter content.

The soils are first divided into coarse-grained, fine-grained, or highly organic soils (Table 4-1). The coarse-grained soils have more than 50% by weight coarser than 0.074 mm (No. 200 sieve). They are given the symbol G (gravel) if more than half of the coarse particles are coarser than 4.76 mm (No. 4 sieve) and S (sand) if more than half are finer. The G or S is followed by a second letter that describes the gradation:

W	well-graded with little or no fines
P	poorly graded, uniform, or gap-graded with little or no finer
M	containing silt or silt and sand
C	containing clay or sand and clay.

The fine-grained soils (more than half finer than the No. 200 sieve) are divided into three groups:

C	clays
M	silts and silty clays
O	organic silts and clays.

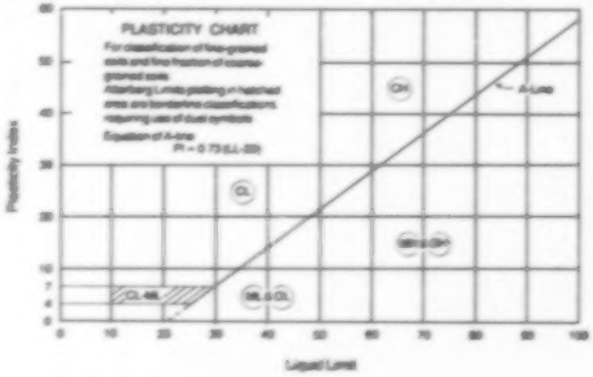
These symbols are followed by a second letter denoting the liquid limit or relative compressibility:

L	a liquid limit less than 50
H	a liquid limit exceeding 50.

The plasticity chart (Table 4-1) is the basis for dividing the fine-grained soils. Silts plot below the "A-line" and clays plot below the "A-line".

For more information on the unified system, see Asphalt Institute. 1969. Soils manual for the design of asphalt pavement structures. Manual Series No. 10, College Park, Maryland.

Table 4-1. The Unified Soil Classification System

Major Divisions			Group Symbols	Typical Names	Classification Criteria		
Coarse-Grained Soils More than 50% retained on No. 200 sieve*	Gravels 50% or more of coarse fraction retained on No. 4 sieve	Clean Gravels	GW	Well-graded gravels and gravel-sand mixtures, little or no fines	Classification on basis of percentage of fines Less than 5% pass No. 200 sieve GW, GP, SW, SP More than 12% pass No. 200 sieve GM, GC, SM, SC 5% to 12% pass No. 200 sieve Borderline classification requiring use of dual symbols	$C_u = D_{60}/D_{10}$ Greater than 4 $C_z = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3	
			GP	Poorly graded gravels and gravel-sand mixtures, little or no fines		Not meeting both criteria for GW	
		Gravels with Fines	GM	Silty gravels, gravel-sand-silt mixtures		Atterberg limits plot below "A" line or plasticity index less than 4	Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols
			GC	Clayed gravels, gravel-sand-clay mixtures		Atterberg limits plot above "A" line and plasticity index greater than 7	
	Sands More than 50% of coarse fraction passes No. 4 sieve	Clean Sands	SW	Well-graded sands and gravelly sands, little or no fines		$C_u = D_{60}/D_{10}$ Greater than 6 $C_z = \frac{(D_{30})^2}{D_{10} \times D_{60}}$ Between 1 and 3	
			SP	Poorly graded sands and gravelly sands, little or no fines		Not meeting both criteria for SW	
		Sands with Fines	SM	Silty sands, sand-silt mixtures		Atterberg limits plot above "A" line or plasticity index less than 4	Atterberg limits plotting in hatched area are borderline classifications requiring use of dual symbols
			SC	Clayey sands, sand-clay mixtures		Atterberg limits plot below "A" line and plasticity index greater than 7	
Fine-Grained Soils 50% or more passes No. 200 sieve*	Silts and Clays Liquid limit 50% or less		ML	Inorganic silts, very fine sands, rock flour, silty or clayey fine sands			
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays			
			OL	Organic silts and organic silty clays of low plasticity			
	Silts and Clays Liquid limit greater than 50%		MH	Inorganic silts, micaceous or diatomaceous fine sands or silts, elastic silts			
			CH	Inorganic clays of high plasticity, fat clays			
			HO	Organic clays of medium to high plasticity			
Highly Organic Soils			PT	Peat, muck, and other highly organic soils			

*Based on the material passing the 3-in. (75 mm.) sieve.

Source: PCA Soil Primer. 1973. Portland Cement Association, Skokie, Ill. 60076.

AASHO CLASSIFICATION SYSTEM

The American Association of State Highway Officials (AASHO) system of soil classification is based on the performance of soils under highway use. Soils having about the same general load-carrying capacity and service characteristics are grouped together to form seven basic soil groups that are designated A-1 through A-7. In general, the best soils for highway subgrades are assessed as A-1 and the poorest are classified A-7.

The AASHO system divides all soils into two categories; granular soils (with 35% or less passing the No. 200 sieve) and silt-clay soils (with more than 35% passing the No. 200 sieve). These two categories are subdivided further, depending on their particle size distribution, as determined by sieve analysis, and their liquid limit and plasticity index values (Table 4-2). For more information on this system, see The Asphalt Institute (1969).

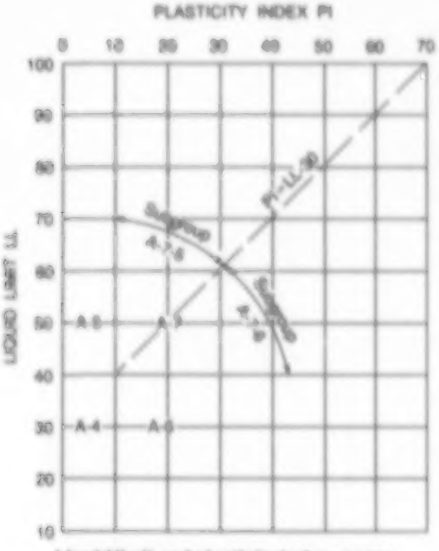
Engineering data for the soils are presented in Table 4-3.

Table 4-2. The AASHO Soil Classification System

General classification	Granular materials (35% or less passing No. 200)							Silt-clay materials (More than 35% passing No. 200)			
Group classification	A-1		A-3	A-2				A-4	A-5	A-6	A-7
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7				A-7-5 A-7-6
Sieve analysis, percent passing:											
No. 10	50 max.	–	–	–	–	–	–	–	–	–	–
No. 40	30 max.	50 max.	51 min.	–	–	–	–	–	–	–	–
No. 200	15 max.	25 max.	10 max.	35 max.	35 max.	35 max.	35 max.	36 min.	36 min.	36 min.	36 min.
Characteristics of fraction passing No. 40:											
Liquid limit	–		–	40 max.	41 min.	40 max.	41 min.	40 max.	41 min.	40 max.	41 min.
Plasticity index	6 max.		NP	10 max.	10 max.	11 min.	11 min.	10 max.	10 max.	11 min.	11 min.*
Usual types of significant constituent materials	Stone fragments, gravel and sand		Fine sand	Silty or clayey gravel and sand				Silty soils		Clayey soils	
General rating as subgrade	Excellent to good					Fair to poor					

*Plasticity index of A-7-5 subgroup is equal to or less than LL minus 30. Plasticity index of A-7-6 subgroup is greater than LL minus 30.

Source: PCA Soil Primer, 1973, Portland Cement Association, Skokie, Ill. 60076.



Liquid limit and plasticity index ranges for A-4, A-5, A-6, and A-7 subgrade groups

Source: PCA Soil Primer. 1973. Portland Cement Association, Skokie, Ill. 60076.

Table 4-3. Engineering data for soil parent materials

Map symbol	Soil association name	Depth (cm)	CSSC soil texture	Estimated classification		Coarse fragments (% by wt.)	Percent passing sieve number			Liquid limit	Plastic limit	Plasticity index
				Unified	AASHO	> 2mm	10	40	200			
By	Barney	60-100	gravelly loam	GM	A-2	49	51	38	30	-	-	-
Br	Bryden	70-100	gravelly loam	SM	A-4	38	62	50	37	18	17	1
Cd	Cobequid	71-100	gravelly sandy loam	GM	A-2	47	53	39	26	17	*NP	NP
Cd	Cobequid	67-100	gravelly sandy loam	GM	A-1	51	49	39	22	15	NP	NP
Cm	Cumberland	70-100	very gravelly sandy loam	GM	A-1	67	33	17	9	16	NP	NP
Cm	Cumberland	65-100	loam	ML	A-4	0	100	99	76	35	27	8
Hd	Hansford	60-100	gravelly sandy loam	GM	A-2	38	62	55	31	20	19	1
He	Hebert	59-100	gravelly sand	GW	A-1	43	57	21	5	12	NP	NP
Jg	Joggins	45-100	clay loam	ML	A-4	22	78	63	54	28	28	4
Jg	Joggins	55-100	silty clay loam	ML	A-4	21	79	67	63	27	24	3
Kh	Kirkhill	70-100	very gravelly loamy sand	GW-GM	A-1	75	25	10	6	16	NP	NP
Kt	Kirkmount	64-100	gravelly sandy loam	GM	A-1	49	51	34	23	14	NP	NP
Kt	Kirkmount	66-100	gravelly sandy loam	GM	A-1	41	59	38	23	15	NP	NP
Mi	Millbrook	70-100	gravelly loam	GC	A-4	46	54	47	38	30	20	10
Ph	Perch Lake	87-100	gravelly sandy loam	GM	A-1	47	53	38	25	16	14	2
Pw	Pugwash	59-100	loam	CL-ML	A-4	0	100	95	50	24	18	6
Pw	Pugwash	85-100	sandy loam	SM	A-4	22	78	63	35	22	NP	NP

(continued)

Table 4-3. Engineering data for soil parent materials (continued)

Map symbol	Soil association name	Depth (cm)	CSSC soil texture	Estimated classification		Coarse fragments (% by wt.)	Percent passing sieve number			Liquid limit	Plastic limit	Plasticity index
				Unified	AASHO	> 2mm	10	40	200			
Qu	Queens	78-100	clay loam	CL	A-4	0	100	98	79	28	18	10
Su	Shulie	80-100	gravelly sandy loam	GM	A-1	52	48	41	17	21	NP	NP
Se	Stewiacke	60-100	sandy loam	ML	A-4	17	83	74	40	17	NP	NP
Se	Stewiacke	18-80	silt loam	ML	A-4	0	100	98	77	-	-	-
Tm	Thom	70-100	gravelly sandy loam	GM	A-1	53	47	32	23	-	-	-
Tm	Thom	70-100	gravelly loam	GM	A-2	57	43	34	26	21	20	1
Wb	Westbrook	64-100	gravelly sandy loam	GM	A-1	39	61	38	25	27	21	6
Wo	Woodbourne	31-100	gravelly clay loam	GC	A-2	56	44	36	31	23	14	9
Wn	Wyvern	87-100	gravelly sandy loam	GM	A-1	56	44	27	17	19	NP	NP

*NP - Non plastic

MAPS
NOT
FILMED

CARTES
OMISES